

# **APPENDIX II**

## **TAB L**

## REBUTTAL OF DOVER EXPERT REPORTS

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### 6. Basis for Expertise in Rebutting Expert Witness Reports

I am Professor of Sociology at the University of Warwick, England.<sup>1</sup> I hold a BA *summa cum laude* in History and Sociology from Columbia University, an M.Phil. in History & Philosophy of Science from Cambridge University, and a Ph.D. in History & Philosophy of Science from the University of Pittsburgh.<sup>2</sup> My area of research is called 'social epistemology', which is the name of a quarterly journal I founded in 1987 and the first of nine published single-authored books. Social epistemology is concerned with the social foundations of knowledge, especially issues relating to how knowledge is institutionalised and legitimated in the larger society. My publications, which also include nearly 300 articles, have been widely reviewed across the arts and sciences and translated into fifteen languages. My eighth book, *Kuhn vs Popper: The Struggle for the Soul of Science*, Columbia University Press, was named Book of the Month (February 2005) by *Popular Science* magazine. I regularly evaluate grant proposals for the major national research funding councils of the US, UK, Canada, Australia, and Finland, and referee manuscripts for academic journals in the humanities, social and natural sciences. I currently participate in long-term projects devoted to assessing the future of organized inquiry sponsored by the Ford Foundation, the Gulbenkian Foundation, and the European Union. Of special relevance to the case is my authorship of *Are Science and Religion Compatible?*, a commentary to a set of readings that includes a consideration of intelligent design (ID). It has been used in the UK's Open University's M.Sc. course in Science Communication since 1998.<sup>3</sup>

I have not acted before as an expert witness in a trial. I am receiving \$100 per hour for compensation.

My rebuttal endeavours to show that, contrary to various opinions expressed in the Expert Reports, ID is a legitimate scientific inquiry that does not constitute 'religion' in a sense that undermines the pursuit of science more generally or, for that matter, undermines the separation of State and Church in the US Constitution. I shall have comments on the Expert Reports authored by the following: Robert Pennock, Kenneth Miller, Barbara Forrest, John Haught, Brian Alters, Kevin Padian. My expertise extends to a consideration of ID in its most developed forms from the standpoint of history, philosophy and sociology of science. However, it does not extend to the various high school textbooks discussed in the Expert Reports. This rebuttal consists of four parts, followed by a conclusion where I summarise my reasoning.

### 1. Is Evolution a Fact or Theory?

<sup>1</sup> Warwick is one of the top five research universities in the UK, and my department ranks in the top three in the discipline.

<sup>2</sup> One of the experts called by the plaintiffs, Robert Pennock, overlapped with me as graduate students at Pittsburgh.

<sup>3</sup> Open University is the original and largest distance learning institution in the world.

*Is evolution a fact or a theory?* This issue arises from the wording of the statement of the Dover School District that provides the pretext for this case. After declaring that the Darwinian evolution is a theory, it states, 'A theory is not a fact'. In his Expert Report, Kenneth Miller devotes much space to shoring up the scientific status of Darwinian evolution in light of this perceived slight. While I happily grant Miller that the Dover statement is less than perspicuous – it seems to conflate 'theory' with 'opinion' – getting clear about the motivating question is important for both sides of the case.

'Evolution' names both a fact and a theory. This is simply a semantic point. On the one hand, 'evolution' is a way of characterising the pattern of data presented by biological history, whereby, roughly speaking, older species tend to be physically simpler, marked by fewer contemporary remains (or 'fossils'), which are found more deeply embedded in the earth. One can accept this pattern of data as itself unproblematic and still keep open the question of how one best explains the pattern. Most proponents of ID accept this 'factual' sense of evolution, as only the more extreme Biblically based ('young earth') Creationists wish to cast aspersions on the fossil record as such. However, as we shall shortly see, the details of even this seemingly harmless sense of 'evolution' have been scientifically challenged. On the other hand, 'evolution' can also refer to the specific Neo-Darwinian explanation for this pattern. This is the 'theory' sense of evolution that gives rise to controversy. It is a much more difficult matter to resolve because proponents of ID and Neo-Darwinism differ over not only the actual explanation of the evolutionary facts but also what counts as an appropriate explanation of those facts. This in turn has bearing on decisions about which hypotheses are worth testing and ultimately the overall direction of the scientific research agenda. When Miller and Robert Pennock seize upon ID aspirations to 'change the ground rules of science' in their Expert Reports, they have caught sight of these more fundamental differences in orientation.

It is worth observing that there is nothing especially unscientific about aiming to change the ground rules of science. Robert Pennock may or may not be correct in his prediction that 'there is no sign that science is about to redefine itself'<sup>4</sup>, but that does not deny the fact that some scientists have self-consciously tried to change the ground rules of science – and succeeded. In particular, the very first self-declared 'scientific revolution', Antoine Lavoisier's Chemical Revolution of the 1780s had exactly this character.<sup>5</sup> The word 'revolution' here was meant to signify a 'return', a re-doing and re-analysing of original experiments on the derivation of metals and gases, to discover

<sup>4</sup> Pennock, Expert Witness Report, section 4.1, paragraph 4. Pennock may well be wrong. The past ten years have witnessed several warnings that the methodological lingua franca of scientific research will need to shift from laboratory experiments to computer simulations for both financial and intellectual reasons. The latter reasons are especially interesting, as they point to a more design-based orientation to science that could favour ID. See especially John Horgan, *The End of Science* (1996) and Stephen Wolfram, *A New Kind of Science* (2002). For a critique of this prospect, see Steven Weinberg, 'Is the universe a computer?' *New York Review of Books*, 24 October 2002.

<sup>5</sup> Of course, what is normally called the 'Scientific Revolution' occurred in the 17<sup>th</sup> century, but it was not the product of self-declared revolutionaries. Indeed, the phrase was coined only in the 1940s. However, Lavoisier himself used the expression 'chemical revolution'. See I. B. Cohen, *Revolutions in Science* (Cambridge MA: Harvard University Press, 1985). Michael Ruse, perhaps the most famous philosophical expert witness for evolutionists, is normally credited with having coined the 'Darwinian Revolution' in title of his 1979 book. However, this was a rather long revolution, since for the first quarter of the 20<sup>th</sup> century – the period marked by the emergence of Mendelian genetics – 'Darwinism' was seen as a degenerating research programme.

an alternative explanation that might then foster a deeper and more unified understanding of phenomena that had been treated rather disparately and inconsistently. Moreover, Lavoisier initiated this revolution in a field of science, chemistry, already enjoying considerable empirical success with the theories it was using. At least in spirit, then, the conduct of ID research – even given its radical rhetoric—is not unfamiliar from the annals of mainstream science.

In public debate, evolution's defenders often equivocate between the 'fact' and 'theory' senses of evolution just defined, which often has the effect of obscuring disputes that remain even over the factual basis for evolution. For example, Pennock refers to the Neo-Darwinist principle of 'common descent' – that all organisms have descended with modification from common ancestors – as a 'basic fact of evolution'.<sup>6</sup> However, anyone familiar with how this principle is treated within the relevant branches of biology knows that 'common descent' names more an article of faith than an established fact, and hence belongs on the 'theory' side of the theory/fact divide. Specifically, there is considerable dispute in the science of organic taxonomy, or cladistics, about how exactly to establish common descent – with some mainstream (at least when compared to ID's proponents) biologists openly suggesting that the principle of common descent may need to be rejected if it cannot be supported in a consistently empirical fashion.<sup>7</sup> At the moment, Neo-Darwinism relies on a rather liberal standard of evidence for establishing common descent – sometimes morphological similarity among organisms suffices, other times more rigorously genetic criteria are used. If one were to employ one or the other standard consistently, the result would be strikingly different patterns to the 'tree of life', which would of course have implications for what exactly Neo-Darwinism – or some successor biological theory – is required to explain.

It is ironic that Pennock denigrates ID as a 'big tent' because its proponents suppress disagreements over the principle of common descent. (Pennock notes correctly that some ID proponents adhere to a scientifically updated version of the Biblical doctrine of 'special creation', whereby each species is individually created.<sup>8</sup>) The irony lies in that the success of Neo-Darwinism since the 1930s and '40s is itself a testimony to the power of 'big tent' thinking. We have already noted this in the case of underplayed differences over how to classify the evolutionary phenomena in need of explanation. But at a more fundamental level, the Neo-Darwinian synthesis brings together a host of qualitative and quantitative methods for studying life – ranging from ethology, ecology and palaeontology to population genetics, animal morphology, and behavioural science – that in their day-to-day practices operate with widely varying assumptions ranging from empirical issues like the plasticity of organisms in the face of environmental changes to more metaphysical issues like whether genes are properly seen as loci of biological causation.<sup>9</sup> Nevertheless, through the diligent efforts of synthetic thinkers and gifted writers like Theodosius Dobzhansky, George Gaylord Simpson, and Julian Huxley, a persuasive vision was

<sup>6</sup> Pennock, Expert Witness Report, section 3.1, paragraph 4.

<sup>7</sup> A good accessible account of the controversies surrounding cladistics is Henry Gee, *Deep Time: Cladistics, the Revolution in Evolution* (London: Fourth Estate, 2000).

<sup>8</sup> It is worth observing that the theory of special creation is more than theological exotica. A parallel doctrine, *polygenesis*, which postulates multiple origins for *Homo sapiens* – sometimes corresponding to races – was an active empirical research programme for much of the 19<sup>th</sup> and 20<sup>th</sup> centuries.

<sup>9</sup> See John Dupre, *The Disorder of Things* (Cambridge MA: Harvard University Press, 1993).

presented of how scientists of all these different orientations could travel under the banner of Darwin. This rather remarkable feat has been the subject of much recent study by historians and rhetoricians of science, since prior to the Neo-Darwinian synthesis, the biological sciences had exhibited the full range of metaphysical and methodological differences still found in the endlessly fractious social sciences.<sup>10</sup>

There is currently no generally agreed explanation for why the biological sciences achieved synthesis in a way that the social sciences never did – despite the efforts of, say, the Harvard sociologist Talcott Parsons, who wrote at roughly the same time the Neo-Darwinian synthesis was forged. However, two things are clear. First, this was *not* a case of scientists being exposed to a new empirical finding that captured their variously disciplined imaginations. The epistemic situation was rather more ordinary. The scientists were simply persuaded to see the relationship of their various disciplines in a new and more collaborative light. Second, the terms of this collaboration required cultivating a strategic sense of when, where and how to expose scientific disagreements.<sup>11</sup> For example, the two leading public expositors of evolutionary theory in recent times, Richard Dawkins and Stephen Jay Gould, hold radically different views about the role of natural selection in explaining the phenomena of evolution. Dawkins imagines that organisms are always at the mercy of the environment, whereas Gould held that organisms are built with an inherent stability that enables them to survive all but the most violent environmental changes.<sup>12</sup> Indeed, as Kevin Padian observes in his Expert Report, ID proponents have realised that Gould's view can be used to bridge the differences between their own position and the evolutionary orthodoxy, though Gould studiously refused to be enrolled in this fashion.

## 2. Science vs Religion or State vs Church?

Many of the Expert Reports present 'science' and 'religion' as mutually exclusive categories of thought and action. For example, in the first sentence of his 'General Opinion', philosopher Robert Pennock argues, '...allowing so-called intelligent design (ID) to be included as part of a science class would have the effect of introducing material that is not only unscientific, but is essentially religious in nature'. Theologian John Haught explicitly distinguishes science from religion in terms of a concern with, respectively, the operation of proximate and ultimate causes in the world. Perhaps the distinction that most tracks the postulation of an absolute difference between science and religion in the Expert Reports is 'natural' versus 'supernatural' – which is found in the Reports by Pennock, Haught, and the philosopher Barbara Forrest. This absolute distinction is often coupled with an invocation of the principle of the separation of Church and State upheld by the US Constitution. Indeed, Pennock claims as part of his expertise for this case his

<sup>10</sup> See especially, V. Betty Smocovitis, *Unifying Biology: The Evolutionary Synthesis and Evolutionary Biology* (Princeton: Princeton University Press, 1996); Leah Ceccarelli, *Shaping Science with Rhetoric: Dabzhansky, Schrödinger, and Wilson* (Chicago: University of Chicago Press, 2001).

<sup>11</sup> Two good participant-observation accounts of this phenomenon have been written in recent years: Ullica Segerstrale, *Defenders of the Truth* (Oxford: Oxford University Press, 2000); Thomas Woodward, *Doubt about Darwin* (Grand Rapids: Baker Books, 2003).

<sup>12</sup> An excellent presentation of the quarter century of Dawkins-Gould debates fought in a variety of popular and professional media is Kim Sterelny, *Dawkins v. Gould: Survival of the Fittest* (London: Icon, 2001).



membership on the National Advisory Board of Americans United for Separation of Church and State, and Forrest especially cites the existence of a 'Wedge Strategy', whereby ID proponents are alleged to be conspiring to convert the US into a proper Christian polity.

There are two general problems with these distinctions. The first is that science and religion are not properly described as mutually exclusive categories. There is no evidence that belief in a supernatural deity inhibits one's ability to study the natural world systematically. If anything, history provides evidence for the contrary thesis – that there is a synergy between the two. Of course, this is not to say that science and religion are identical. They are simply not mutually exclusive in the manner presupposed in the Expert Reports. In that case, demonstrating a religious character to ID is not sufficient to prove that it is unscientific. I shall return to this first general problem in more detail below, but let me turn more briefly to the second general problem: that the distinction between science and religion does not correspond to the distinction between state and church.

The state-church distinction was drawn to ensure that the state would be neutral with respect to the various religious faiths to which the early American colonists belonged, in contrast to Britain, where allegiance to the Anglican Church had been required for holding major civil offices. However, the two distinctions are often conflated in debates over ID's status because of the suspicion that ID's proponents are indeed trying to reassert just such a religious monopoly. Thus, the Expert Reports of Pennock, Haught, and Forrest place great store by the alleged specificity of ID's religious presuppositions – the prospect that ID would have only one religious doctrine introduced into biology classrooms. However, the evidence for this specificity, which in principle would be a source for Constitution-based concerns, is undermined by the lack of agreement among the Expert Reports about the exact nature of the religious monopoly that ID would impose. While Haught claims to detect a rejection of 'theistic evolution' by ID proponents in favour of a view more favourable to special creation and the argument from design, Pennock claims to see a 'big tent' strategy at work whereby ID proponents holding various religious beliefs strategically suppress their disagreements. Haught and Pennock regard their opposing observations as relevant to the present case only because they engage in complementary conflation strategies: Haught reads the science-religion distinction as the state-church distinction, whereas Pennock reads the state-church distinction as science-religion distinction.

The question that begs to be asked amidst these conflations is how the state comes to be identified with science. Politically the most persuasive answer has been that scientists have principled ways of reaching agreement on knowledge that can reliably get action in the world, whereas religious groups disagree over matters of fundamental principle that inhibit collective development and occasionally lead to violence. At least, this way of seeing things seemed to inspire the original wave of public school teaching of science as the 'civil religion' of the US during the Progressive Era of the early 20<sup>th</sup> century, a period marked by the influx of immigrants of widely disparate cultural, ideological, and religious backgrounds. For major thinkers of the day like John Dewey, science education was essential to a vision of the US as the 'melting pot', whereby the newly arrived would exchange their divisive pasts for an empowering yet peaceful future, which in turn would consolidate their

identity as 'Americans'.<sup>13</sup> The historic benchmark for this vision had been the establishment of the Royal Society of London in 1620 as a safe haven for scientific work that explicitly prohibited the introduction of religious discussion into its proceedings. This institution was established in the midst of the English Civil War, which was largely fought on religious grounds – a consequence of which, of course, had been the migration of the early settlers to North America.<sup>14</sup>

It is worth observing that the sharp contrast between the unity of science and the divisiveness of religion was most persuasive in the fifty-year period prior to the First World War. That was the first war to demonstrate, on a broadly international scale, science's own capacity for destruction, typically with scientists' active involvement in the military effort. In the years following the war, more sceptical attitudes toward the socially unifying powers of science emerged – without the older progressive attitudes disappearing. These included, in the American context, the renaissance of largely Protestant-based Christian fundamentalism, which interpreted the Bible literally and without error. The half century prior to World War I had been marked by various attempts at rapprochement between evangelical Christianity and Darwinism in both the US and UK, in which evolution was generally portrayed as providing the details of a divinely inspired Creation. In contrast, religious fundamentalism's postulation of a sharp opposition between Darwin and the Bible emerged from the senseless loss of life in the First World War, which was read as science's betrayal of its Christian adherents.<sup>15</sup> And the more science came to be implicated in the destruction and misery that plagued the 20<sup>th</sup> century, the more fundamentalists have gained followers. It would be fair to say that ID, with its ambiguous position concerning matters of science and religion, has benefited from these vicissitudes in social and intellectual history, since national scientific establishments have typically taken what, at least in retrospect, appear to have been morally undesirable courses of action. In that case, science's much vaunted capacity to reach consensus vis-à-vis religion may not quite have the cachet it had when it was originally promoted, now a century ago.

However, at a more basic level, the distinction between science and religion is rather crude and, in any case, not mutually exclusive. The main problem with the distinction is that it basically contrasts two concepts that function in markedly different ways. In particular, 'science' is a positively marked and 'religion' a negatively marked term. In other words, if we look at the full range of things that count as 'science' and 'religion', we find that sciences are defined in terms of what they are, whereas religions are defined in terms of what they are not. 'Science' refers to the most authoritative form of knowledge over some domain of reality or the method used to obtain such knowledge. In contrast, 'religion' is a residual term for complex systems of belief and social relations that do not require the state for their origin or

<sup>13</sup> On the social and philosophical context of Dewey's progressivism, including its antipathy to organised religion, see Morton White, *Social Thought in America: The Revolt against Formalism* (Boston: Beacon Press, 1957). Sidney Hook, the topic of Barbara Forrest's doctoral dissertation, which qualifies her as an expert on philosophical naturalism, was probably the student of Dewey's most prominent in US public intellectual life in the third quarter of the 20<sup>th</sup> century.

<sup>14</sup> On the iconic status of the Royal Society in the history of science, see Robert Proctor, *Value-Free Science? Purity and Power in Modern Knowledge* (Cambridge MA: Harvard University Press, 1991), chap. 2.

<sup>15</sup> On the transition from evangelical support to opposition to Darwin, see David Livingstone, *Darwin's Forgotten Defenders: The Encounter between Evangelical Theology and Evolutionary Thought* (Grand Rapids: William Eerdmans, 1984).

maintenance. The latter definition is especially worth noting because, contrary to the suggestion of Pennock, Forrest, and Haught, the full range of things that normally count as religions – ranging from Christianity and Islam to Hinduism and tribal religions – do not share any fixed, let alone ‘supernatural’, attitudes toward the world, however abstractly one would wish to specify these. (For example, Hinduism is generally regarded as a naturalistic religion.) In fact, classifications of the ‘great world religions’ date only to the early days of sociology and anthropology in the 19<sup>th</sup> century, when they were presented as examples of ‘pre-modern’ or ‘traditional’ social formations largely conducted by ritual (the etymological origin of ‘religion’), often shrouded in a mythical history. The implied contrast was with an explicit ‘social contract’ by which modern Europeanised states were established and maintained.

Precisely because science and religion are such different *kinds* of concepts, there is no conceptual problem with the idea that science might be conducted in a way that reflects or is influenced by religious attitudes. Of course, it does not follow that all religiously inflected science is good science but the mere presence of a religious attitude does not constitute a proper test. It is worth observing that the fiercest defender of Darwin in his day, the biologist Thomas Henry Huxley, dealt with this matter very fairly in his Romanes Lecture of 1893, ‘Evolution and Ethics’. Huxley observed that while Darwinism’s naturalistic world-view had been anticipated by, say, the Greek atomistic and Epicurean philosophers, as well as Hindus and Buddhists, none were inspired to develop their insights into a full-fledged science. Indeed, they were discouraged, mainly because that very world-view had persuaded them that humans are simply temporary arrangements of matter, no different in kind from other such arrangements, and hence should strive to avoid suffering for the brief time we exist in our current form. Huxley’s point, which I believe is historically accurate, is that the contrasting view of the monotheistic religions, which elevate the status of humanity as ‘the image and likeness of God’, have been primarily responsible for science as a detailed, comprehensive view of the cosmos, an articulated vision of the unity of nature, that was perhaps best exemplified by Newtonian mechanics. For Huxley, the challenge of his age was somehow to preserve that intellectually ambitious spirit – which had led Newton to believe he could know the mind of God -- as Darwin’s much less arrogant view of humans came to be accepted more widely in society. While Huxley was a fully signed-up Darwinian, he believed that Darwinism’s metaphysically diminished sense of humanity could easily discourage the pursuit of science in the future as it had in the past.

There are two features of Newton’s world-view that are easily taken for granted today but would be difficult to motivate had Newton not imagined himself as trying to simulate divine thought processes.<sup>16</sup> The first is the very idea that there is a unitary view of the world that can be described in terms of a finite set of universal laws. For Newton, these laws were applied in absolute space and time, which he characterised as God’s ‘sensorium’, or as we might now say, the ‘interface’ between God and Creation. In other words, Newton imagined that there was a fixed point from which everything could be seen and its overall structure discerned. This is not a trivial assumption. It is much more specific and focused than vague naturalistic appeals to ‘curiosity’ that would portray Newton as a sophisticated version of an animal scoping

<sup>16</sup> This narrative posture continues today in popular science writing, not least Steven Hawking, *A Brief History of Time* (1988).



out its immediate environment. The second relevant feature of the Newtonian world-view is the search for ultimate explanations that both transcend and unify the disparate phenomena revealed to our immediate senses. In other words, Newton sought to provide the same explanation for things that had been previously explained separately. Not surprisingly, the proposed explanations turn out to have a lower prior probability – i.e. they are counter-intuitive. One wonders, then, why Newton would have supposed the need for such explanations in the first place. Indeed, this search for ultimate explanations led him to postulate a universal force of physical attraction called 'gravity' which, despite its mathematical specifiability, was treated as 'action at a distance' and hence 'supernatural' by most of his contemporaries. Clearly Newton imagined that the universe was created from a single plan – as did Darwin when he began the intellectual trajectory that led him to the theory of natural selection.

My point in recounting this history is not to demonstrate the scientific validity of religious beliefs. Rather, it is to highlight the heuristic function of certain religious beliefs – specifically monotheistic ones that privilege humanity – in putting one in a frame of mind that motivates the sustained pursuit of scientific inquiry. That ID might discourage students from thinking scientifically about the world seems to be the major pedagogical source of concern in the Dover case. This suspicion is historically unfounded. As Darwin's own biography demonstrates, the eventual scope and power of his theory of natural selection was very much the product of a thorough engagement with the argument from design in natural theology. It is unlikely that without this engagement, Darwin would have arrived at a theory as detailed and nuanced as he did, which has enabled it to serve as a blueprint for subsequent biological research.

Moreover, the heuristic value of monotheism is not simply limited to Darwin but extends well into the 20<sup>th</sup> century. Perhaps the best example is provided unwittingly by Kenneth Miller, who quotes the geneticist Theodosius Dobzhansky's famous slogan, 'Nothing in biology makes sense except in light of evolution'.<sup>17</sup> Dobzhansky was both an architect of the Neo-Darwinian synthesis and a devout Russian Orthodox Christian who did not see his scientific and religious views as independent of each other. Here are the final two paragraphs of the article that bears Dobzhansky's slogan as its title:

Does the evolutionary doctrine clash with religious faith? It does not. It is a blunder to mistake the Holy Scriptures for elementary textbooks of astronomy, geology, biology, and anthropology. Only if symbols are construed to mean what they are not intended to mean can there arise imaginary, insoluble conflicts. As pointed out above, the blunder leads to blasphemy: the Creator is accused of systematic deceitfulness.

One of the great thinkers of our age, Pierre Teilhard de Chardin, wrote the following: "Is evolution a theory, a system, or a hypothesis? It is much more. It is a general postulate to which all theories, all hypotheses, all systems much henceforward bow and which they must satisfy in order to be thinkable and true. Evolution is a light which illuminates all facts, a trajectory which all lines of thought must follow. This is what evolution is." Of course, some scientists, as well as some philosophers and theologians, disagree with some parts of

<sup>17</sup> Miller, Expert Witness Report, section 1, paragraph 2.

Teilhard's teachings; the acceptance of his worldview falls short of universal. But there is no doubt at all that Teilhard was a truly and deeply religious man and that Christianity was the cornerstone of his worldview. Moreover, in his worldview science and faith were not segregated in watertight compartments, as they are with so many people. They were harmoniously fitting parts of his worldview. Teilhard was a creationist, but one who understood that the Creation is realized in this world by means of evolution.<sup>18</sup>

In endorsing the views of the great Jesuit paleontologist Teilhard de Chardin (a discoverer of the Peking Man fossils in 1929), Dobzhansky appears to be joining common cause with ID proponents who accept the basic facts of evolution. In any case, he is not advancing the strict segregation of science and religion. Indeed, Dobzhansky had previously praised Teilhard de Chardin in his 1967 book, *The Biology of Ultimate Concern*, a title that could not more explicitly merge scientific and religious themes.

I conclude that, in the absence of any general agreement among ID proponents about their religious assumptions, and the generally positive role that religious assumptions have historically played in the promotion of science, my considered judgement is that ID's religious dimensions are both legally and scientifically benign.

### 3. Supernaturalism vs. Naturalism

Several Expert Reports attempt to show, in Robert Pennock's words, 'ID departs from the acceptable methodological practice of science from the very first step, in appealing to a realm beyond nature'... ID remains at base inherently supernaturalistic. By virtue of that fact alone it is not science, but religion'.<sup>19</sup> However, this argument strategy is faulty. Specifically, the appeal to the supernatural is neither sufficient nor necessary to count a form of inquiry as either religious or non-scientific. We have already considered the difficulties in drawing a useful distinction between science and religion. Moreover, both supernaturalism and its philosophical opposite, naturalism, have been integral to the history of scientific inquiry, each exerting constraint on the other.

'Supernaturalism' is an evocative term in modern secular culture, and it is easy to trade on its associations with mysterious spirit-worlds that appear to defy the laws of physics, otherwise known as 'animism'. This is the form of supernaturalism originally associated with so-called primitive cultures that 'failed' to draw a distinction between profane and sacred space – that is to say, between the natural and the divine. To the 19<sup>th</sup> century anthropologist, these cultures appeared to inhabit fantasy worlds in which figments of the imagination freely interacted with physical entities. In this context, it is worth observing that 'supernaturalism' is something of a misnomer. It is the anthropologist – not the primitive – who has a vested interest in cordoning off the 'supernatural' as a specific realm of being. The primitive's 'problem', then, is that he cannot tell where the anthropologist's sense of 'natural' ends and of 'supernatural' begins. This 'problem' continues to haunt discussions of ID, as Neo-Darwinists insist on drawing distinctions where ID proponents see only continuities.

<sup>18</sup> From Theodosius Dobzhansky, 'Nothing in biology makes sense except in light of evolution', *The American Biology Teacher*, March 1973 (3): 125-9.

<sup>19</sup> Pennock, Expert Witness Report, section 2, paragraph 2.

It would seem that two matters are frequently confused in charges of ID's 'supernaturalism'. On the one hand, it is true that ID wishes to pursue research that might eventuate in design-based explanations of the natural world that fall afoul of the naturalistic presuppositions of contemporary biological science. On the other hand, ID proponents do not regard such explanations as themselves requiring a sharp break with the methods of science. In other words, ID proponents argue primarily by appeal to empirical evidence gathered in the laboratory and the field, employing methods of reasoning – both qualitative and quantitative – familiar from the other branches of science. The only difference here from Neo-Darwinists is that ID proponents tend to draw different conclusions. Indeed, contrary to Pennock's assertion that 'introducing the supernatural undermines the very basis for empirical testing'<sup>20</sup>, ID proponents believe precisely that specific supernatural explanations are testable. To be sure, some ID proponents also wish to draw corroborating testimony from the Bible but, crucially, this forms a diminishing proportion of ID's argumentative arsenal.<sup>21</sup>

When criticising ID, Neo-Darwinists are inclined to slide from observing (correctly) that ID challenges the metaphysical naturalism of contemporary biology to inferring (incorrectly) that ID challenges the established methods of scientific inquiry. It is the latter, not the former, point that conjures up the image of 'supernaturalism' as equivalent to a primitive 'irrationalism'. However, ID does not challenge science, only the artificially restricted conceptual horizons within which science is practised under the Neo-Darwinist regime. Indeed, Neo-Darwinist philosophers unwittingly concede this point, as their critiques of ID increasingly look like their critiques of normal scientific theories: They are not about ID's problematic metaphysical assumptions about a Divine Creator but about the validity of specific inferences that ID proponents draw from bodies of evidence or lines of reasoning already familiar to Neo-Darwinists from their own research contexts.

Moreover, ID's position is far from unusual. Although one would never guess this from the number of philosophers of science who over the years have volunteered their services to the Neo-Darwinist cause, naturalism remains a controversial position within academic philosophy. In fact, it is probably still a minority position in philosophy as a whole, though it may enjoy majority status in the philosophy of science – understood as a field distinct from and more specialised than epistemology, the general theory of knowledge. Like most broadly defined philosophical positions, naturalism has been interpreted in various ways ever since the term was coined to characterise Baruch Spinoza's philosophy 300 years ago. Specifically, naturalism has metamorphosed from a heretical to a dogmatic attitude toward knowledge.<sup>22</sup> It originally enabled science to challenge theological orthodoxy. But today naturalism is the voice of the scientific establishment, especially when dealing with theologically inspired interlopers, such as ID. A candid expression of this viewpoint is provided by Richard Lewontin, the Harvard population geneticist who has spent much of his career criticising illicit extensions of Neo-Darwinism into matters of public policy:

<sup>20</sup> Pennock, Expert Witness Report, section 4.5, paragraph 1.

<sup>21</sup> Moreover, the Bible is invoked as a heuristic to focus more conventional forms of scientific inquiry (e.g. pay more attention to radical breaks in the fossil record), not to overrule or undermine such inquiry.

<sup>22</sup> For the philosophical implications of this metamorphosis, see Steve Fuller, 'Descriptive vs Revisionary Social Epistemology: the Former as Seen by the Latter', *Episteme* 1/1 (2004): 23-34.

It is not that the methods and institutions of science somehow compel us to accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our *a priori* adherence to material causes to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how counter-intuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door.<sup>23</sup>

What follows is a necessarily brief history of this transformation in the fortunes of naturalism.

Spinoza controversially held that the natural and the divine present two aspects of the same reality. We literally inhabit God's being. The deity does not reside in a superior reality beyond the one with which we are normally acquainted. In this form, naturalism encouraged theologians to advance historical and empirical explanations of Biblical phenomena, with God revealing himself through the usual methods of science. Indeed, Spinoza's naturalism largely inspired the separation of academic theology from its traditional pastoral function, a seminal moment in the modern understanding of 'knowledge pursued for its own sake', what Max Weber later called 'science as a vocation'. At first, naturalism was politically controversial because it denied the legitimacy of claims to divinely sanctioned authority that could not be backed with secular evidence, such as properly validated documents. However, naturalism became controversial within the academy once the methods of science began to sharply deviate from documentary base of theology – which coincides with when the natural sciences start to challenge the authority of the humanities in the universities in the mid-19<sup>th</sup> century. (More generally I refer here to the ascendancy of laboratory- and field-based over text-based research.) By the mid-20<sup>th</sup> century, 'naturalism', now understood in its contemporary sense as genuflection to the natural sciences, became the dominant academic ideology.<sup>24</sup>

However, most philosophers have resisted the charms of naturalism, mainly because in practice it would hand over epistemic authority to a specific community of inquirers – scientists and their authorised agents – who are no less prone to errors of judgement than non-scientists. This refusal to commit to naturalism is less an ostrich-like reaction to the inevitable march of scientific progress than an allergic response to guild-like arrogance of scientists. Philosophers typically approach the problem of knowledge with an open-minded attitude towards the means and ends of its pursuit. In contrast, the naturalistic privileging of certain disciplines, theories and methods implies that most of these fundamental epistemological questions have been already resolved. Like most philosophers, ID proponents believe these matters are still worth keeping open, if only on grounds of human fallibility. Here one recalls the figure of the 'sceptic' who always imagines an alternative explanation for any apparently straightforward phenomenon. Such an attitude is in marked contrast to what Thomas Kuhn famously called the 'normal scientist' who presumes – until overwhelmed by unexplained phenomena – one explanatory framework, or 'paradigm', within which she single-mindedly conducts her research. Much of the fire focussed on ID proceeds

<sup>23</sup> Richard Lewontin, 'The Demon Haunted World', *New York Review of Books* 9 Jan 1997, p. 31.

<sup>24</sup> By 'dominant academic ideology', I mean that the natural sciences – more specifically the physical sciences – established the benchmark against which other forms of knowledge came to be judged. Moreover, this has extended beyond core epistemic judgments of empirical reliability to size of research grants, proliferation of publications, and intensification of technicality.



from these Kuhnian premises: that one is not entitled to offer a competing explanation for, say, the biochemical stability of a living cell, if the scientific establishment already provides a reasonably good one.<sup>25</sup>

Philosophical open-mindedness towards the means and ends of knowledge has been typically expressed in a manner that is receptive – without being dogmatically wedded – to the multiple methods of science. Perhaps the leading American epistemologist of the last half-century, Roderick Chisholm, drew a relevant distinction in his 1973 Aquinas Lecture at Marquette University in Milwaukee.<sup>26</sup> On the one hand, some philosophers start from what we know and then ask how we know it. They presuppose that most of what we believe is true. On the other hand, some philosophers start from the view that we are always faced with conflicting knowledge claims and hence require a reliable decision procedure for resolving the conflict. They presuppose that much, though not all, of what we believe is false. In terms of the history of analytic philosophy – the dominant school in the English-speaking world – the former broadly capture the ‘ordinary language’ philosophers, the latter the ‘logical positivist’ philosophers. A key point to keep in mind in the ensuing discussion is that *neither* are naturalists – at least without serious qualification.

The first class of philosophers grant that we know many things by many different means. Indeed, our ordinary ways of speaking may be treated as repositories of metaphysical insight. For example, the fact that we use two largely non-overlapping discourses to refer to our mental and physical lives suggests that there may be distinct realms of ‘mind’ and ‘body’, such that the former ‘transcends’ the latter and hence may require a distinct mode of epistemic access. Philosophers who hold such a view tend to be metaphysical dualists or pluralists – that is, they believe that reality consists of more than one domain of being. In principle at least, they are open to supernaturalism. Yet, such philosophers, even when anti-naturalistic, have not been anti-scientific.

For example, three distinguished mid-20<sup>th</sup> century analytic philosophers – C.D. Broad (1887-1971), C.J. Ducasse (1881-1969), and H.H. Price (1899-1985) – incorporated discussions of paranormal phenomena and life after death into their major epistemological treatises.<sup>27</sup> None claimed to have demonstrated the existence of these traditionally supernatural phenomena, but they were careful not to let the issue be decided by methods inappropriate to the putative objects of inquiry simply because those were the methods used to decide other things scientists studied. Thus, all three philosophers devoted much time to criticising attempts to terminate inquiry prematurely into the supernatural by scientists who proposed criteria of validity – as expressed in, say, experiments designed to detect the presence of ‘psychic’ causation –

<sup>25</sup> Thomas Kuhn, *The Structure of Scientific Revolutions*, 2<sup>nd</sup> edn. (Orig. 1962) (Chicago: University of Chicago Press, 1970). This book was probably the most influential work on the nature of science in the second half of the 20<sup>th</sup> century and continues to influence theorists of science today. For a systematic critique of this work, especially vis-à-vis its role in inhibiting the openness of scientific inquiry, see Steve Fuller, *Thomas Kuhn: A Philosophical History for Our Times* (Chicago: University of Chicago Press, 2000).

<sup>26</sup> Chisholm’s lecture, ‘The Problem of the Criterion’, is one of the most highly anthologized essays in contemporary epistemology. It also appears as a chapter in his own book, *The Foundations of Knowing* (Minneapolis: University of Minnesota Press, 1982).

<sup>27</sup> Relevant works include C.D. Broad, *The Mind’s Place in Nature* (1925); C.J. Ducasse, *Nature, Mind, and Death* (1951); H.H. Price, *Thinking and Experience* (1953).

- that virtually guaranteed that the distinctiveness of the putative objects would *not* be registered. The underlying principle shared by these philosophers is that the failure of orthodox scientific methods to register supernatural phenomena may just as much reflect a failure in the methodological imagination as the absence of the alleged phenomena.

Lest one suspect that this principle amounts to wishful thinking, it is worth observing that evolutionists have also benefited from a naturalistic version of it. After all, without presuming that sub-human species were capable of complex forms of communication, evolutionists would never have set aside the most obvious evidence to the contrary and endeavoured to devise ever subtler experiments that might enable, say, a chimp or even a beehive to manifest their latent communicative powers. That animals cannot make sense of our talk was not taken to be conclusive proof that they cannot communicate. Rather, it was taken to imply that accessing any latent communicative powers would require especially clever experimental designs. If there is a general tendency in the branch of Neo-Darwinism called 'evolutionary psychology', it is that the cleverer the experiments humans design, the smarter the animal subjects turn out to be. One might then equally countenance that cleverer research designs will eventually enable us to attribute 'intelligent design' or 'irreducible complexity' to entities that perhaps do not *prima facie* possess those properties.

In this respect, the attempt, especially by Kenneth Miller, to refute William Dembski's and Michael Behe's claims to have already identified such properties is reminiscent of older sceptical arguments about animal communication. Miller argues '... that the scientific literature contains counter-examples to any assertion that evolution cannot explain biochemical complexity... [or]...how evolutionary mechanisms allow biological systems to increase in informational content'.<sup>28</sup> Miller's arguments appeal more to Ockham's Razor – that one does not require exotic explanations – than to an attack of the exotic explanation on its own terms. Miller does not so much disprove the claims of ID as show that ID is not necessary to explain the phenomena in question. Thus, just as sceptics used to say that a chimp's apparent linguistic facility could be explained as merely locally effective learned behaviours, Miller equally claims that ordinary evolutionary explanations can be deployed to account for the biochemical patterns that Dembski and Behe wish to explain as 'intelligently designed' or 'irreducibly complex'. Here Miller may be taking advantage of the tendency of ID proponents to overplay their hand rhetorically. The epistemological legitimacy of ID merely requires that ID provides an explanatory framework that can be the basis for a body of scientific research. It does not require showing the contrary thesis, that evolution cannot provide a credible alternative framework.

The second class of philosophers identified by Chisholm is more easily recognisable from debates concerning ID and its Creationist precursors. These are philosophers who presume that because we are always faced with multiple and often conflicting knowledge, we must settle on a method to decide the differences. When Pennock in his Expert Report stresses the need for scientific knowledge claims to be 'testable', he is alluding to this strand of epistemological thought. In the philosophy of science, it

<sup>28</sup> Miller, Expert Witness Report, section 4.2, paragraph 13.

gave rise to what is known as the 'demarcation problem': How does one tell the difference between genuinely scientific theories and ones that merely pretend to be scientific, or 'pseudoscience', as they are popularly known? Creationism was first judged (wanting) in these terms in the 1982 *McLean vs. Arkansas* case, when the presiding Judge William Overton invoked a general version of what Rudolf Carnap or Karl Popper would have recognised as a 'demarcation criterion':

A scientific theory must be tentative and always subject to revision or abandonment in light of facts that are consistent with, or falsify, the theory. A theory that is by its own terms dogmatic, absolutist, and never subject to revision is not a scientific theory.<sup>29</sup>

I do not take the view of many – perhaps even most – philosophers who have not participated in cases involving Creationism or ID that this criterion is much too coarse-grained to capture the nature of scientific inquiry. I happily accept it – as long as we take seriously the spirit in which it is proposed. The logical positivists proposed the demarcation criterion in order to provide a common medium for comparatively evaluating knowledge claims. Like a judicial proceeding, the criterion was to be specified in a manner neutral to the competing parties. Exactly what might count as a 'neutral language' of evaluation led to endless wrangling amongst the positivists and their eventual abandonment of the demarcationist project. However, one thing they managed to agree on – and contrary to how the Expert Reports would now wish to have ID judged -- was that the criterion could *not* simply consist of judging a newcomer theory in the terms of the incumbent. This was for two reasons: either the trial would be clearly biased to the incumbent, thereby inhibiting any truly novel breakthroughs in science, or the newcomer would be encouraged to recast his own knowledge claims in the incumbent's terms. The latter resulted in 'pseudoscience', which the positivists found the more pressing problem in the 1920s and '30s.

However, the original demarcationist concern with pseudoscience significantly differed from its re-invention in the 1980s during the Creationist trials. The main examples of pseudoscience cited by the positivists were not drawn from the religious domain but rather Marxism and psychoanalysis. They were concerned mainly with attempts to extend legitimate scientific findings into domains where they pre-empted people's decision-making capacities, as in 'Science shows that the revolution is coming' or 'Science shows that your fate is sealed by age five'. Karl Popper, who probably did the most to popularise demarcationism, believed that Marxism and psychoanalysis held valuable insights but that their proponents tended to overstate their significance in the public domain, where the evidence base was less secure – largely because the relevant knowledge claims could not be properly tested – yet action based on those claims could hold disastrous political consequences.<sup>30</sup> I raise this point because were Popper and the positivists alive today, they would probably channel their demarcationist impulses not toward ID or even Creationism, but toward what Michael Ruse has recently called 'evolutionism', namely, the overextension of evolutionary arguments into the human realm, where their tendentiousness is masked by an epistemic 'halo effect' from the high quality research evolutionists have done

<sup>29</sup> William Overton, 'Opinion, *McLean vs Arkansas*', in M. LaFollette, *Creationism, Science and the Law: The Arkansas Case* (Cambridge MA: MIT Press, 1983), pp. 62-3.

<sup>30</sup> On the original Viennese context of the demarcation project, see Malachi Hacoen, *Karl Popper: The Formative Years 1902-1945* (Cambridge UK: Cambridge University Press, 2000), chap. 5.

on sub-human animals.<sup>31</sup> Examples of such evolutionism appear virtually daily in the public sphere. A recent high-profile example is the pronouncement by Harvard President Larry Summers that women may be genetically ill-suited for doing science.

Given the fixation of the Expert Reports on science's naturalistic assumptions, it is striking that, after an initial flirtation with naturalism by logical positivism's founder, Moritz Schlick, the positivists did not adopt a strong pro-naturalist stance when trying to design demarcation criteria. This may be because, like the lawyer Phillip Johnson and other ID proponents today, they viewed naturalism as more an unconditional world-view – 'metaphysics' in the objectionable sense -- than a testable hypothesis. In that respect, they may have seen it as scientifically on a par with supernaturalism.

In any case, as the quote from Judge Overton suggests, philosophers of science gradually gave up the project of constructing their own demarcation criteria in favour of examining the history of organized inquiry for the spontaneous emergence of criteria that imply the regular testing of knowledge claims. Overton did not find such criteria emerging from the Creationist materials he encountered in 1982. However, the situation is rather different in 2005. Here one need only contrast an important book written shortly after the trial, Dorothy Nelkin, *The Creation Controversy: Science or Scripture in the Schools* (New York: Norton, 1982), and an equally important one published shortly before this case, Michael Ruse, *Darwin and Design: Does Evolution Have a Purpose?* (Cambridge MA: Harvard University Press, 2003). Both are clearly pro-evolution and anti-ID but the nature of that opposition has clearly evolved. Instead of ID being situated amidst the scientific illiteracy of Biblical literalists, it is set against a broader tradition of natural theology that is admitted to intersect at many points with the pursuit of mainstream physical and biological science. Moreover, Ruse spends much time distinguishing ID positions from cognate non-ID positions, arguing against the former on much more technical grounds than was needed twenty years ago – often by appealing to recent Neo-Darwinian developments that are still controversial in their own fields.

This striking transformation in the presentation of ID by its opponents suggests that even evolutionists concede that ID has become more scientific in the pursuit of its inquiries, thus requiring critiques that approximate the level of sophistication that evolutionists normally would reserve for their colleagues. Unfortunately, this point is easily obscured in the Expert Reports, which under the guise of Pennock's 'big tent' tend to present ID as perhaps heterogeneous in its beliefs but without any internal dynamic that might provide evidence of intellectual growth over the past two decades.

#### 4. The Centrality of Evolution Theory to Contemporary Life Sciences

<sup>31</sup> Michael Ruse, *The Evolution-Creation Struggle* (Cambridge MA: Harvard University Press, 2005). Although it cannot be pursued here, a better application of the demarcation criterion would be to re-analyse the iconic trial *State of Tennessee vs. John T. Scopes* (1925), especially in light of a full consideration of William Jennings Bryan's expert testimony for the State. At the time, Darwinism was widely interpreted as a doctrine of biological determinism that justified a 'survival of the fittest' mentality that justified the most rapacious tendencies of Big Business. Bryan argued that the *prima facie* First Amendment claims of Scopes (who was defended by the ACLU) were outweighed by the threat posed by the promulgation of a profoundly divisive speculative theory, as one might still regard the teaching of racist theories today.



The Expert Reports by those with expertise in the biological sciences assert the centrality of evolutionary theory to the conduct of modern life sciences. As Brian Alters puts it, 'All leading science education associations and scientific associations do agree that learning about evolution is one of the most important concepts, if not the most important concept, in a biology course, and that students cannot attain a well-rounded background in science without learning evolution'.<sup>32</sup> I do not wish to dispute the fact that such agreement exists. I only wish to contest whether it is empirically well-founded. The most authoritative statement of this consensus over the centrality of evolution is provided by Kenneth Miller, co-author of the textbook that the Dover Area School District found wanting in its coverage of non-Darwinist approaches to biology. In his Expert Report, he quoted the following statement from the preface of the US National Academy of Sciences 1999 position paper, 'Science and Creationism':

The concept of evolution is one of the most important ideas ever generated by the application of scientific methods to the natural world. The evolution of all organisms that live on Earth today from ancestors that lived in the past is at the core of genetics, biochemistry, neurobiology, physiology, ecology, and other biological disciplines. It helps to explain the emergence of new infectious diseases, the development of antibiotic resistance in bacteria, the agricultural relationships among wild and domestic plants and animal, the composition of Earth's atmosphere, the molecular machinery of the cell, the similarities between human beings and other primates, and countless other features of the biological and physical world.<sup>33</sup>

That Darwinian evolution is of such widespread significance is frequently declared but rarely documented. Suppose one did not already happen to believe the above statement, where would she go to find verification? The answer is far from clear.

On closer inspection, the statement hedges its bets by claiming that evolution 'helps to explain' a wide variety of biological phenomena, which implies that evolution may be sufficient but not necessary for understanding these phenomena. But why would the National Academy of Sciences hedge in this fashion? Two reasons come to mind. First, some of the self-declared Darwinists may indeed explain, say, the emergence of new infectious diseases or the development of antibiotic resistance but also observe that what we stigmatise as 'disease' is simply an anthropomorphic response to the normal workings of natural selection. Such are the insights of 'Darwinian medicine', whose controversial implications for health policy the NAS may wish to distance itself from.<sup>34</sup> The second reason may be that, as a matter of fact, reference to the claims of Darwinian evolution is unnecessary for the conduct of the vast majority of contemporary biological research. I do not mean that most biologists doubt the general validity of the Neo-Darwinian approach. Rather, their adherence to Darwin has little or no palpable influence on their day-to-day research activities. In other words, Neo-Darwinism functions more as a disposable 'made for export' world-view than a code of professional conduct. This point bears on the case because Brian Alters explicitly argues in his Expert Report – and others imply – that failure to present Neo-Darwinism as the dominant position in biology would 'improperly prepar[e]

<sup>32</sup> Alters, Expert Witness Report, section 1, paragraph 2.

<sup>33</sup> Miller, Expert Witness Report, section 1, paragraph 2.

<sup>34</sup> See R. Nesse, and G. Williams, *Why We Get Sick: The New Science of Darwinian Medicine*. (New York: Vintage, 1996).

students for postsecondary education at secular schools<sup>35</sup>. Insofar as high school science courses *should* prepare students to pursue still more science in college (itself not a self-evident aim, given the specialised nature of tertiary education<sup>36</sup>), how exactly does Neo-Darwinism contribute to this task?

A relevant benchmark is offered by Nicolas Rasmussen, an historian of 20<sup>th</sup> century biomedical science and editor of the main science and technology studies reviews journal. Here he comments, with some exasperation, on philosophers who write books that make it seem that biology is *only* about evolution:

I know of no evolutionary biologists who would seriously claim that the theory they treat is the motor of all life science, at least not while other biologists are around. On the contrary, evolutionists sometimes seem to display anxiety that other biologists doubt that what they do – computer programming, scuba diving, or butterfly catching instead of keeping their noses to a laboratory grindstone – is really biology at all. One must keep in mind that the life sciences are not now, and never have been, theoretically, methodologically, or socially integrated to anywhere near the degree that the various branches of physics are. As a point of fact most biologists do not know, and do not need to know, much about evolutionary theory. It is unlikely that any of the life sciences deriving their basic logic from experimental physiology (including molecular genetics, classical genetics, biochemistry, pharmacology, etc.) would have to change its ways substantially in a Lamarckian or even Creationist world. Anatomical fields (including cell biology, if it does not fall under the physiological) are just as theoretically independent, as is ecology, insofar as they concern themselves with short time frames. Arguably, even systematics and paleontology might go on much as before without evolutionary theory, provided some other non-Darwinian concept of relatedness (like pre-Darwinian *Bauplan*) were employed. [Philosopher Elliott] Sober's book wants theoretical problems in evolution to look important, but application of the pragmatist's criterion (what difference any of the things he discusses makes in practice to biology in general) would leave the issue much in doubt.<sup>37</sup>

Rasmussen underscores the point by observing that, even using liberal criteria, *less than 10%* of the articles published each year in the journals included in *Biological Abstracts* are devoted to evolutionary theory. At the very least, such a finding suggests that the status of evolution may be debated safely without worrying that its refutation might undermine the rest of biology. One reason why this rather obvious fact is not normally registered is that philosophers, scientists, and the public more generally still assume a model of science based on physics, which has quite explicitly strived over the past 400 years to arrive at a unified account of reality consisting of a consistent ontology closed under a finite set of mathematical laws. As I noted earlier, this model of science was itself inspired by ID-style considerations – and it is ironic that it persists as the implicit philosophy of the practitioners of a discipline, biology, that demonstrates so much less coherence across its specialties.

<sup>35</sup> Alters, Expert Witness Report, section 5, paragraph 1.

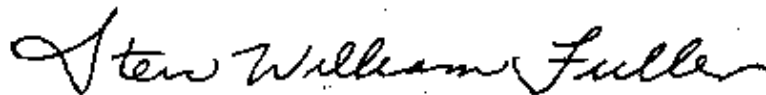
<sup>36</sup> The idea that high school science courses should seed future college science majors is a holdover of Cold War science education policy. Such expectations are not normally made of other subjects as students move from secondary to tertiary education.

<sup>37</sup> Nicolas Rasmussen, "Surveying Evolution," *Metascience* 5 (1994): 57-8.

## 5. Summary and Conclusions

Based on the above reasoning, I conclude that ID is a legitimate scientific inquiry that does not constitute 'religion' in a sense that undermines the pursuit of science more generally or, for that matter, undermines the separation of State and Church in the US Constitution. In the first place, there is nothing inherently unscientific about ID's contestation of the factual and/or theoretical basis of evolutionary theory. Evolutionists themselves do it, and there is precedent in the history of science for fundamental rethinking of even theories that were in their day empirically and practically successful. Second, 'science' and 'religion' are not mutually exclusive terms, and indeed it is generally acknowledged – even by leading biological scientists like Huxley and Dobzhansky – that precisely the sort of religious vision associated with ID has played a positive role in the promotion of science. Religion potentially plays a negative role only if an orthodoxy monopolises state institutions, such as the public schools. However, ID is religiously very heterodox. Moreover, science is equally inhibited by the emergence of an unchecked *scientific* orthodoxy – and, in this respect, ID may play an especially salutary role as a counterbalance. Third, ID's rejection of naturalism and commitment to supernaturalism does not make it unscientific. Indeed, contrary to the tenor of the Expert Reports, philosophers have been more suspicious toward naturalism and open-minded toward supernaturalism as naturalism has become the voice of the scientific orthodoxy. This applies equally to the logical positivists who first proposed 'demarcation criteria' for science, in terms of which Creationism and ID have been found wanting in the past. However, an examination of the historical development of ID as a research programme over the past twenty years – not least on the basis of how ID is treated by its critics – reveals that the field has achieved scientific legitimacy. Finally, contrary to the Expert Reports, evolutionary theory is not so central to the everyday conduct of biological research that it cannot be subject to serious scrutiny or criticism from those operating with radically different assumptions about the nature of life. Although most biologists may believe in the truth of Neo-Darwinism, that belief is largely unconnected with the work they actually do.

Respectfully submitted



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 Biography listed in Contemporary Authors, vol.137 (1992), p. 145 [updated 2002]; The Writer's Directory (2000); Who's Who in Science and Engineering (2002); Who's Who in the World (2003); Dictionary of International Biography (2004).  
 Languages (reading): French, Latin.

#### EDUCATION

*University of Pittsburgh*: Ph.D., 1985 (History & Philosophy of Science) for "Bounded Rationality in Law and Science," directed by J.E. McGuire.  
*Cambridge University*: M.Phil., 1981 (History & Philosophy of Science) for "The Concept of Reduction in Phenomenology and Logical Positivism," directed by Mary Hesse.  
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#### REGULAR ACADEMIC POSTS

1999- Professor of Sociology, University of Warwick, England  
 1994-99 Professor of Sociology & Social Policy, University of Durham, England  
 1993-94 Associate Professor of Rhetoric & Communication, University of Pittsburgh  
 1988-94 Assistant to Associate Professor of Science & Technology Studies, Virginia Tech  
 1985-88 Assistant Professor of Philosophy, University of Colorado, Boulder  
 1982-85 Teaching Fellow in History & Philosophy of Science, University of Pittsburgh

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2004 Visiting Professor in the Institute of Communication, University of Lund at Helsingborg, Sweden (Summer term, continuing)  
 2003 Visiting Professor of Information and Communication Studies, and Visiting Fellow at the Center for Governance, UCLA (Spring term)  
 2003 Visiting Professor of Management, Politics, and Philosophy, Copenhagen Business School (Winter term)  
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 1997 Visiting Professor of Sociology, University of Tel-Aviv (Spring term)  
 1995 Fulbright Professor in Science & Technology Studies, University of Gothenburg, Sweden (Spring term)  
 1995 Fellow, Swedish Collegium for Advanced Study in the Social Sciences (Winter term)  
 1994 Visiting Scholar, Centre for the History & Philosophy of Science, Berlin (December)  
 1990 Visiting Professor, Netherlands Graduate Programs in Science & Technology Studies (November).



**ACADEMIC HONOURS AND AWARDS**

- 1985 Apple Teaching Award, Pittsburgh.
- 1981-82 Andrew Mellon Pre-Doctoral Fellowship, Pittsburgh.
- 1979-81 Kellett Fellowship, Clare College, Cambridge.
- 1979 Class Salutatorian, Columbia (graduated no. 2 in class of 650).
- 1978 Junior Phi Beta Kappa.
- 1977 National Merit Scholar.
- 1976 John Jay Scholar, Columbia.

**PROFESSIONAL HONOURS AND AWARDS**

- 2000 Appointed Fellow, UK's Economic and Social Research Council (ESRC) College of Sociology, History, Anthropology and Resources. (term ended 2003)
- 1999 President of the Academic Board, Knowledge Management Consortium International.
- 1998 First ESRC Fellow in Public Understanding of Science
- 1995 Elected Fellow of the Royal Society for the Arts
- 1989 First NSF Post-Doctoral Fellow in History & Philosophy of Science, University of Iowa (topic: Rhetoric of Disciplinary Boundaries in the Social Sciences; sponsor: Donald McCloskey)

**ACADEMIC PUBLICATIONS****Books (Completed)**

1. Social Epistemology, Indiana University Press (1988), xv + 316pp.; paperback in 1991. Second edition, with new introduction (2002), pp. ix-xxiv.
  - a. Chapter 1 re-printed in N. Stehr and R. Grundmann (eds.), Knowledge: Critical Concepts (Routledge, 2005).
2. Philosophy of Science and Its Discontents, Westview Press (1989), x + 188 pp.; second edition with new first chapter (paperback), Guilford Press (1993), xvi + 240 pp. Reprinted 1995.
3. Philosophy, Rhetoric and the End of Knowledge: The Coming of Science and Technology Studies, University of Wisconsin Press, xxii + 421 pp. (cloth and paper, 1993). Second edition, Lawrence Erlbaum Associates, with James H. Collier xxix + 367 pp. (cloth and paper, 2004). New subtitle: A New Beginning for Science and Technology Studies. Includes revised introduction, some rewriting and abridgement, as well as end-of-chapter questions (provided by Collier) xxix + 367 pp.
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  - b. Chinese translation in preparation (China Translation and Publishing Corporation).
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  - a. Chinese translation in preparation (Shanghai Scientific & Technological Education Publishing House).
  - b. Chapter 6 reprinted in M.J. Smith, eds. Philosophy and Methodology of the Social Sciences, vol. 3 (Sage, 2005);
  - c. Chapter 7 reprinted in P. Mirowski and E-M Sent, eds., Science Bought and Sold: Essays in the Economics of Science (University of Chicago Press, 2002), pp. 444-61.
6. Thomas Kuhn: A Philosophical History for Our Times, University of Chicago Press (2000),

- xvii + 472 pp. (paper 2002).
- a. Russian translation (Science [Russian Academy of Sciences], 2003)
  - b. Japanese translation in preparation (Kaimaisha).
  - c. South Asian English edition in preparation (Longmans Orient).
7. Knowledge Management Foundations. Butterworth-Heinemann (2002), xi + 279 pp. (paper).
    - a. Japanese translation in preparation. (Shin'yosha).
  8. Kuhn vs Popper: The Struggle for the Soul of Science. Icon Books (2003), 232 pp.
    - a. Danish translation, with new postscript (Danish Sociology Press, 2004).
    - b. US edition, with new preface and glossary (Columbia University Press, 2005). [Named 'Book of the Month', Popular Science, February 2005]
    - c. Japanese translation (Chikuma Shobo Ltd).
    - d. Korean translation (Thinking Tree Publishing Co.)
  9. The Intellectual, Icon Books (2005), 184 pp.
    - a. Korean translation (Science Books)

**Authored Books (under contract, submitted but not yet published)**

1. Re-Imagining Sociology. Sage (2005)
2. The Philosophy of Science and Technology Studies. Routledge (2005)
3. Social Epistemology: A Word Map. Shin'yosha [Japanese] (2005)

**Books: Edited**

1. The Cognitive Turn: Psychological and Sociological Perspectives on Science, edited by Steve Fuller, Marc De Mey, Terry Shinn, and Steve Woolgar, 1989 Sociology of Sciences Yearbook, Kluwer Academic Publishers (1989), xv + 260 pp.
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#### **Journal Publications in Social Epistemology**

(As the journal's executive editor, 1987-1997, I had primary responsibility for fitting all papers into the appropriate formats. I also wrote the Preview for each issue. Listed below are the pieces in which I am identified as author or interviewer. Articles from 1998 onward have been peer-reviewed.)

1. Statement of Purpose, in 1,1 (1987), pp.1-4.

2. Provocation on Belief, Part Three in 1.1 (1987), pp.102-105.
3. Interview with Marc De Mey on the possibility of Cognitive Science as a focal point for Science Studies, in 1.1 (1987), pp. 83-95.
4. Review of La Connaissance Ordinaire by Michel Maffesoli, in 1.1 (1987), pp. 109-111.
5. Introduction to the Symposium on Ethnocentrism and Knowledge Production, in 1.2 (1987), pp.117-21.
6. Commentary on Harry Redner's 'Pathologies of Science', in 1.3 (1987), pp. 265-6.
7. Toward Objectivism and Relativism (Review essay on Randall Albury's The Politics of Objectivity and David Wong's Moral Relativity), in 1.4 (1987), pp. 351-61.
8. Provocation on Reproducing Perspectives, Part Three, in 2.1 (1988), pp. 99-101.
9. Introduction to the Open Peer Commentary 'In Defense of Relativism', in 2.3 (1988), pp. 197-9.
10. Why Narrative Is Not Enough (Part of debate on law, practice, interpretation and argument), in 5.1 (1991), pp. 70-4.
11. On Rosenwein and Gorman's Simulation of Social Epistemology, in 9.1 (1995), pp. 81-6.
12. Interdisciplinary Rhetoric: Lessons for Both Rhetor and Rhetorician, in 9.2 (1995), pp. 201-4.
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14. The Science Wars: Who Exactly is the Enemy?, in 13, 4 (1999): 243-50.  
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3. \_\_\_\_\_, Back to Descartes? The Very Idea!, on S. Woolgar's Science: the Very Idea, in Social Studies of Science, May 1989
4. \_\_\_\_\_, Why Not a Unified Rhetoric of Inquiry?, on J. Nelson et al., The Rhetoric of the Human Sciences, in Annals of Scholarship (1989) 6, pp. 311-317.
5. \_\_\_\_\_, Philosophy of Science Since Kuhn: Readings on the Revolution That Has Yet to Come, in Choice, December 1989, pp. 595-601.
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British Journal of Sociology: Unhastening Science by D. Pels. (vol. 55, no. 1, 2004).

Canadian Journal of Sociology: Cognitive Relativism and Social Science, eds. D. Raven et al. (Dec 1992); Historical Ontology by I. Hacking (Sep 2004); Values in Conflict by P. Axelrod

Canadian Philosophical Reviews: Objects of All Sorts by V. Descombes (Jul 1987), Horizons of Continental Philosophy, ed. H. Silverman (May 1989), The Past Within Us by R. Martin (Aug 1990), Knowledge and Politics, eds. V. Meja and N. Stehr (Aug 1991), Spectacles and Predicaments by E. Gellner (Apr 1991), Picoeconomics by G. Ainslie (Oct 1992), Simulating Science by M. Gorman (Dec 1992), Microsociology by T. Scheff (Aug 1993).

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Philosophy of Social Science by A. Rosenberg (Jan 1989), Real People by K. Wilkes (Apr 1989), The Rational and the Social by J.R. Brown (Jun 1989), Postmodern Social Analysis and Criticism by J. Murphy (Dec 1989), Discovering by R.S. Root-Bernstein (Mar 1990), The Chances of Explanation by P. Humphreys (May 1990), Universals by D. Armstrong (Jun 1990), Three Treatments of Universals by Roger Bacon, trans. T. Maloney (Jun 1990), The Moral Domain, ed. T. Wren (Sep 1990), The Science of Pleasure by H. Ferguson (Dec 1990), Reason and Morality by R. Fumerton (Dec 1990), Heuristic Research by C. Moustakas (Jan 1991), The Justification of Science and the Rationality of Religious Belief by M. Banner (Mar 1991), Berkeley's Revolution in Vision by M. Atherton (Apr 1991), Theories of Science in Society, eds. S. Cozzens and T. Gieryn (May 1991), Interpreting Evolution by J. Birk (Nov 1991), The New Aspects of Time by M. Capek (Oct 1991), Time and Experience by P. MacInerney (Dec 1991), Models of My Life by H. Simon (Dec 1991), Scientism by T. Sorell (Feb 1992), Time, Space, and Philosophy by C. Ray (Apr 1992), Chronotypes, eds. J. Bender and D. Wellbery (Apr 1992), Liaisons by A. Goldman (Jul 1992), Philosophy and AI, eds. R. Cummins and J. Pollock (Sep 1992), The Professional Quest for Truth by S. Fuchs (Nov 1992), Blind Realism by R. Almeder (Nov 1992), Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice, eds. R. Duschl and R. Hamilton (Dec 1992), Shaping Technology/Building Society, eds. W. Bijker and J. Law (Mar 1993), Renewing Philosophy by H. Putnam (May 1993), Popper in China, eds. W. Newton-Smith and J. Tianji (May 1993), In Search for a Better World by K. Popper (May 1993), Understanding Science by A. Strahler (Jun 1993), World Changes, ed. P. Horwich (Oct 1993), Knowledge without Expertise by R. Sassower (Nov 1993), Popper's Views on Natural and Social Science by C. Simkin (Dec 1993), Philosophical Applications of Cognitive Science by A. Goldman (Jan 1994), Beyond Relativism by R. Masters (Feb 1994), Scientific Failure, eds. T. Horowitz and A. Janis (Apr 1994), The Play of Nature by R. Crease (May 1994), Between Philosophy and Social Science by M. Horkheimer (Sep 1994), On Max Horkheimer, eds. S. Benhabib et al. (Sep 1994), Kant and the Mind by A. Brook (Oct 1994), Smoke and Mirrors by J.R. Brown (Nov 1994).

Contemporary Sociology: About Science by B. Barnes (Nov 1986)

Informal Logic: Persuading Science, eds. M. Pera and W. Shea (Winter 1993)

Information, Communication and Society: Modernity and Technology, eds. T. Misa et al.

International Studies in Philosophy: Science as Power by S. Aronowitz (1992, no. 3), Science as Salvation by M. Midgley (1994, no. 1), Wild Knowledge by W. Wright (1995, no. 1), The Advancement of Science by P. Kitcher; Injustice and Restitution by S.D. Ross (1995, no. 4).

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Isis: The Rational and the Social by J.R. Brown (Sep 1991), Science and its Fabrication by A. Chalmers (Dec 1991), Essays on the Theory of Scientific Cognition by J. Kmita (Jun 1992), Scientism by T. Sorell (Dec 1992), Beyond Reason ed. G. Muevar (Mar 1993), Pandora's Hope by B. Latour (Jun 2000); The Invention of Modern Science by I. Stengers (Jun 2002); Return to Reason by S. Toulmin (Sep 2004)

Journal of the American Forensic Association: Rationality and Relativism eds. M. Hollis and S. Lukes (Fall 1984).

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*Science, Technology, and Human Values: Shaping Written Knowledge* by C. Bazerman (Winter 1991); *Engaging Science* by J. Rouse (Winter 1998); *The Road since Structure* by T. Kuhn (Spring 2001).

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#### **Newsletter Articles and Miscellaneous Academic Pieces**

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5. \_\_\_\_\_. For Epistemology in Social Theory, Perspectives (American Sociological Association Theory Section Newsletter) 14 (1991) 3, pp. 6-7.

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9. \_\_\_\_\_. Give STS a Place on which to Stand and It Will Move the University -- and Society, Science, Technology & Society Newsletter No. 92 (December 1992), pp. 4-6.

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17. \_\_\_\_\_. Confessions of a Recovering Kuhnian, Social Studies of Science 27 (1997): 492-494.

18. \_\_\_\_\_. Constructing the High Church-Low Church Distinction in STS Textbooks, Technoscience vol. 10, no. 3 (1997), pp. 10-11.

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Antonio de Lopez Cerezo), Organizacion de Estados Iberoamericanos (full translation of November 1995 interview in Oviedo, Spain, posted March 1997, <http://www.oei.org.co/cts/fuller.htm>)

21. \_\_\_\_\_. Whose Style? Whose Substance? Sokal vs. Latour at the LSE: A Report on the 2 July 1998 Debate. *Technoscience*, vol. 11, no. 3 (1998), pp. 9-10.

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22. \_\_\_\_\_. Academic Hiring Practices in the USA vs. UK. *The University of Warwick Newsletter*, No. 254 (June 2000), p. 5.

23. \_\_\_\_\_. Foreword to *The Future of Knowledge Production in the Academy*, Merle Jacob and Tomas Hellstrom (eds.), Open University Press (2000), pp. xi-xv

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#### **PUBLISHED REVIEWS OF FULLER'S WORK (excluding edited books)**

*Social Epistemology* (the journal): *Choice* [Sept 87], *The Library Journal* [1 Feb 88], *Times Higher Education Supplement* [4 Mar 88], *Philosophical Books* [Oct 88].

*Social Epistemology* (the book): *Choice* [May 89], *Times Higher Education Supplement* [9 June 89], *American Journal of Sociology* [July 89], *Social Studies of Science* [May 89], *Metascience*, the Australasian Science Studies Annual [1989], *EASST Newsletter* [March 89], *Quarterly Journal of Speech* [May 90], *Contemporary Psychology* [June 90], *Erkenntnis* [July 90], *Canadian Philosophical Reviews* [Sept 90], *International Newsletter of the History & Philosophy of Science Teaching Group* [Oct 90; reprinted in *Science and Education*, vol. 1, no. 3, 92], *Isis* [Dec 90], *Philosophy of the Social Sciences* [March 91], *Inquiry* [Sept 91], *Nous* [Dec 91], *Philosophy of Mathematics Education Newsletter* [Dec 92], *Annals of Scholarship* [1992: vol. 9, nos. 1/2], *Journal of Economic and Social Intelligence* [1992: vol. 2, no. 2], *Exceptional Human Experience* [Dec 95].

*Philosophy of Science and Its Discontents*: *Choice* [Oct 89], *Science & Technology Book News* [Oct 89], *Reference and Research Book News* [Dec 89], *Quarterly Journal of Speech* [May 1990], *Review of Metaphysics* [Jun 1990], *Times Higher Education Supplement* [21 Sept 90], *Canadian Philosophical Reviews* [Oct 90], *Contemporary Psychology* [Dec 90], *Philosophy of the Social Sciences* [Jun 91], *Studies in History & Philosophy of Science* [Sep 91], *Sociological Inquiry* [Fall 91], *Annals of Scholarship* [1992: vol. 9, nos. 1/2], *EASST Newsletter* [Jun 93], *Nous* [Jun 93], *Philosophical Psychology*, [1993: vol. 6, no. 3], *Science Books & Films* [Oct 93], *Social Studies of Science* [Feb 94], *Science & Technology Studies* [Spring 94], *Isis* [Sep 94], *Canadian Journal of Communication* [1994: vol. 19, no. 2], *New Ideas in Psychology* [1995: vol.

13, no. 1]; Informal Logic [Winter 1996]

Philosophy, Rhetoric & the End of Knowledge: The Library Journal [Aug 93]; Times Higher Education Supplement [10 Sept 93]; Reference and Research Book News [Nov 93]; Choice [Jan 94]; Contemporary Sociology [Mar 94]; New Scientist [14 May 94]; Science, Technology & Society [Summer 94]; Science, Technology & Human Values [Autumn 94]; College English [Nov 94]; Quarterly Journal of Speech [Feb 95 and Feb 96]; Radical Philosophy [Sept/Oct 95]; Philosophy of the Social Sciences [Dec 95]; Theory and Psychology [May 96]; Historia Scientiarum (Japan) [Vol. 6-1, 1996]; Philosophy and Rhetoric [Jun 96]; EASST Review [Dec 97]; Philosophy in Review [Apr 05]; Philosophy and Rhetoric [Sep 05]

Science: Futures [Aug 97]; Nature [2 Oct 97]; Roundabout (Open U. Newsletter) [Feb 98]; New Scientist [23 May 98]; History of the Human Sciences [May 98]; Isis [Dec 98]; Metascience [Jul 98]; Public Understanding of Science [Jul 98]; Choice [Sep 98]; Sociological Research Online [vol. 3, no. 3, 1998]; Journal of World Systems Research [vol. 4, no. 3, 1998]; Science, Technology & Human Values [Autumn 1998]; Times Higher Education Supplement [13 Nov 98]; Fundacion Voc (Colombia) [Nov 98]; Interdisciplinary Science Reviews [Dec 98]; Science, Technology & Society (New Delhi) [vol. 3, no. 2, 1998]; Journal of the Royal Anthropological Institute [vol. 4, no. 4, 1998]; Contemporary Sociology [Jan 99]; Wavelength (U. of West of England) [Feb 99]; Rhetoric and Public Affairs [Winter 98]; American Journal of Sociology [Mar 99]; Studies in Science Education [vol. 33, 1999]; Theoria (Spain) [vol. 15, no. 1, 2000]; Ratio [Mar 00]; Philosophy of the Social Sciences [Mar 00]; Science as Culture [vol. 9, no. 1, 2000]; Paideia (Spain) [Mar 00]; Studies in History & Philosophy of Science [Jun 00]; Philosophy of the Social Sciences [Jun 03].

The Governance of Science: Interdisciplinary Science Reviews [Mar 00]; Science [7 Apr 00]; Science, Technology & Human Values [Autumn 00]; Choice [July/August 00]; Minerva [vol. 38/1, 2000]; Public Understanding of Science [Oct 00]; CBS (Copenhagen Business School) Review [Oct 00]; International Studies in the Philosophy of Science [March 01]; Sociological Research Online [vol. 6, no. 1, 2001]; Prometheus [Sept 01]; Canadian Journal of Sociology [Fall 01]; Futures [Mar 02]; Institute of the Vienna Circle Yearbook [vol. 9, 2000/1]; Philosophy of the Social Sciences [Jun 03]; British Educational Research Journal [Dec 2003]

Thomas Kahn: The Washington Times [14 May 00]; Booklist [15 May 00]; The New York Times [28 May 00]; The New Criterion [Jun 00]; Science [9 Jun 00]; Institute of the Vienna Circle Yearbook [vol. 9, 2000/1]; Physics World [Jul 00]; The Library Journal [Aug 00]; Scientific American [Sep 00]; Technology Review [Sep/Oct 00]; Moderna Tider (Swedish) [Oct 00]; Choice [Nov 00]; Times Higher Education Supplement [10 Nov 00]; Science, Technology & Society [Fall 2000]; Science and Public Policy [Dec 00]; Frankfurter Allgemeine Zeitung [13 Feb 01]; Svenska Dagbladet (Swedish) [14 Feb 01]; Lychnos (Swedish History of Science Society) [2001]; Physics Today [Mar 01]; Interdisciplinary Science Reviews [Spring 2001]; Physikalische Blätter (German) [57 (2) 2001]; Review of Politics [vol. 63, no. 2, 2001]; Philosophy of Science [June 2001]; Current Science (India) [10 Jun 01]; History of the Human Sciences [Summer 2001]; Metascience [July 01]; Fourth Door Review (UK) [Issue 5, 2001]; Isis [Jun 01]; London Review of Books [19 July 01]; Antioch Review [Summer 01]; Law and Social Inquiry [Fall 01]; Quarterly Journal of Speech [Nov 01]; Philosophy in Review [2001, no. 1]; New Zealand Sociology [2001, no. 1]; Journal of American History [Dec 01]; Canadian Journal of History [Dec 2001]; Magill's Literary Annual [2001]; Physics in Perspective [Feb 02]; Infosatellite.com [27 Feb 02]; Common Knowledge [vol. 8, no. 2, 2002]; Critique (Paris) [nos. 661-662, June/July 2002]; Review of Communication [Oct 02]; Minerva [2003, vol. 41 (4)]; Journal of Economic Methodology [vol. 9, no. 1, 2002]; Journalism Studies [2002, vol. 3 (4)]; International Journal of

Philosophical Studies [vol. 10, no. 3 (2002)]; History of Science [Mar 03]; Philosophy of the Social Sciences [June 03]; Revista de Libros (Madrid) [no. 78, Jun 03]; International Studies in the Philosophy of Science [vol. 17, no. 1, 2003]; Metapsychology [Mental Health Network, 17 June 03]; History of Political Economy [Fall 03]; The European Legacy [Dec 03]; History & Philosophy of the Life Sciences [Sep 03]; Anthropological Theory [Sep 03]; Theoria (Spain) [Jan 04]; Modern Intellectual History [Aug 04]

Knowledge Management Foundations: Galileo (Latin American e-journal of metascience, Uruguay) [Jan-Feb 02]; Harvard Business School Working Knowledge [28 May 02]; CBS (Copenhagen Business School) Review [Apr 02]; InSite (Canadian electronic reviews service) [Mar 02]; Dagens Forskning (Sweden) [21 Oct 02]; Information Research (UK electronic journal [Vol. 8, 2002/3]); Compare (Oct 02); VEST [vol. 16, 1, 2003]; Change Management Monitor [Jan 03]; Organization [Jul 04]; Management Learning [Sep 04]; Ephemera [vol. 4, no. 4, 2004]

Kuhn vs Popper: The Economist [9 Aug 03]; New Scientist [6 Sep 03]; The Weekend Australian [27 Sep 03]; APC Magazine (Australia) [Nov 03]; Times Literary Supplement [7 Nov 03]; Dagens Nyheter (Stockholm) [31 Dec 03]; New Directions [Sep 04]; Epistemologia & Filosofija Nauki (Russia) [2004, no. 2]; Kirkus Reviews [15 Nov 04]; Theoria in Praksa (Slovenia) [3-4/2004]; Social Kritik (Denmark) [no. 96/2004]; Popular Science [1 Feb 05]; Financial Times [24 Feb 05]; International Studies in Philosophy [Mar 05]; The Complete Review (on-line) [20 Apr 05]; Philosophy of the Social Sciences [Sep 05]; Journal of the History of Behavioral Sciences ...

The Intellectual: Dagens Nyheter (Stockholm) [10 Mar 05]; Guardian [12 Mar 05]; LUSU On-line (Lancaster University Student Union) [26 Apr 05]; Business Times Asia (Singapore) [Apr 05]

#### CONFERENCES, SYMPOSIA, AND JOURNALS ON FULLER'S WORK

1. Weeklong seminar on the mutual relevance of psychology of science and social epistemology, Memphis State University (July 1988). Principal interlocutors: Barry Gholson, Arthur Houts, William Shadish.
2. Symposium on Social Epistemology and Philosophy of Science and Its Discontents. Symposiasts: Warren Schmaus, Harold Brown, Arie Kruglanski, Theodore Porter, Ryan Tweney. Published in Philosophy of the Social Sciences, June 1991.
3. Symposium on 'Social Epistemology and Its Discontents', jointly sponsored by Philosophy of Science Association and the Society for Social Studies of Science, Minneapolis (October 1990). Panelists: Warren Schmaus, Joseph Rouse, Paul Roth, Steve Woolgar. Published in Inquiry, September 1991.
4. Roundtable on Social Epistemology, Groningen University, Netherlands (November 1990). Panelists: Theo Kuipers, Dick Pels, Hans Harbers, Hans Radder. Published in Kennis & Methode, Summer 1991.
5. Special issue of Argumentation on Social Epistemology, Summer 1994. Critics include Charles Willard, John Lyne, Brian Baigrie, Angelo Corlett, Malcolm Ashmore.
6. Symposium on Philosophy, Rhetoric and the End of Knowledge, sponsored by the Society for Social Studies of Science, New Orleans (October 1994). Panelists: Wesley Shrum, William Keith, Marianne de Laet, Brian Baigrie. Published in Philosophy of the Social Sciences, December 1995.
7. Symposium on Fuller's Normative Social Epistemology, sponsored by the American Philosophical Association, San Francisco (March 1997). Panelists: Heidi Grasswick, Jennifer Faust.
8. Symposium on Fuller's social epistemology at the Japan STS conference, Kyoto, March 1998.



Panelists: Tadashi Kobayashi, Hideyuki Hirakawa, Osamu Kanamori, Hidetoshi Kihara

9. Exchanges on Science: With Anthony Barnett (Interdisciplinary Science Reviews, Dec 1998). With Jonathan Osborne (Wavelength, Feb 1999)

10. Symposium on The Governance of Science at Research Centre for Advanced Science and Technology, Tokyo, July 1999. Panelists: Yuko Fujigaki, Hideyuki Hirakawa, Osamu Kanamori, Hidetoshi Kihara

11. Symposium on The Governance of Science, sponsored by the Society for Social Studies of Science, San Diego (October 1999). Panelists: Jose Lopez Cerezo, James Collier, David Guston, William Keith, Hans Radder. Published in Futures, vol. 34, no. 2 (March 2002) with articles by Keith, Collier, Lopez Cerezo, Guston, and Jerome Ravetz. Fuller's response published in vol. 34, no. 5 (June 2002).

12. On-line symposium on The Governance of Science at [Hayek-k@maelstrom.stjohns.edu](mailto:Hayek-k@maelstrom.stjohns.edu) (23 July-1 August 2000).

13. Symposium on Thomas Kuhn, sponsored by the Joint British-North American History of Science Societies, St Louis (August 2000). Panelists: Paul Roth, Philip Mirowski, Jan Golinski, Jeff Hughes. Roth's and Mirowski's papers appear, with response by Fuller, in History of the Human Sciences (Summer 2001).

14. On-line colloquy on Thomas Kuhn, sponsored by The Chronicle of Higher Education, in conjunction with feature article (15 September 2000). Website: <http://chronicle.com/colloquy/2000/kuhn/kuhn.htm>.

15. Symposium on Thomas Kuhn, sponsored by the Australasian Association of History, Philosophy, and Social Studies of Science, Melbourne (June 2001). Panelists: John Fox, John Schuster, James Ladwig, Stuart Evers.

16. Symposium on Thomas Kuhn in Metascience (July 2001). Commentators: Barry Barnes, Kenneth Caneva.

17. On-line seminar on "Interdisciplinarity: The loss of the heroic vision in the marketplace of ideas," sponsored by the Institut Nicod (CNRS, Paris), October 2003. Website (both in English and French): <http://www.interdisciplines.org/interdisciplinarity/papers/>

18. Symposium on the status of intellectuals, History of the Human Sciences (Nov 2004), based on 2003 article, with responses from S. Gattei, R. Sassower and G. McClennan & T. Osborne.

19. Symposium on the 'Recovering the Left from Darwin in the 21<sup>st</sup> century', Futures (Dec 2004), with responses from K. Junker, J. Emblemavag, B. Tonn, J. Ravetz

20. Symposium on the second edition of Philosophy, Rhetoric and the End of Knowledge, in Philosophy and Rhetoric (2005, no. 3), with commentaries from C. Isager and S. Just, T. Basbøll, J. Collier, with response from Fuller.

#### ORAL PRESENTATIONS (multiples indicated in brackets; no redundancy in listings)

**Distinguished Lectures:** Beatty Memorial Lectures (McGill U., Sep 1999 [2]); Templeton Lecture in Science and Religion (Rensselaer Polytechnic Institute, Sep 1999); St Catherine's Lecture in Philosophy (Warwick U., Feb 2000); Orville and Maude Hitchcock Memorial Distinguished Lecture in Rhetoric (U. Iowa, Apr 2000); Annual Edward Westermarck Memorial Lecture, Finnish Sociological Association (U. Helsinki, Nov 2002); Richard Bangs Collier Institute Lecture in Science and Ethics (U. Puget Sound, Apr 2004); First Annual Science, Technology & Environment Lecture, Foley Institute (Washington State U., Apr 2004); Annual Nicholas Mullins Lecture in Science & Technology Studies (Virginia Tech, Mar 2005).

**Keynote and Plenary Addresses:** International Congress of Personal Construct Psychology (SUNY-Albany, Aug 1991); Academic Knowledge and Political Power (U. Maryland, Nov 1992); Reappraising Rationality (Southern Illinois U., Mar 1993); Inquiries in Social

Construction (U. New Hampshire, Jun 1993); St Louis Philosophy Graduate Student Association Annual Meeting (St Louis U., Mar 1994); Eastern Carolina Medical School Third Annual Doctoral Student Research Conference (Greenville NC, Jan 1995); Knowledge and Discourse (U. Hong Kong, Jun 1996); Science and Its Critics (U. Kansas, Feb 1997); Language for Special Purposes (Copenhagen Business School, Aug 1997); European Society for the History of the Human Sciences (U. Durham, Aug 1998); The Future of the University (U. Helsinki, Oct 1998); First Annual Philosophy of Social Science Roundtable (U. St Louis, Apr 1999); First Annual Pan-Irish Science Communication Conference (Dublin City U., Apr 1999); Social Science Journal Quality (Institute for Policy Studies, London, May 2000); 'Science under Pressure?': Annual Conference of the Danish Institute for Studies in Research and Research Policy (Aarhus, Sep 2000); Practical Scientific Knowledge (Hanse Institute for Advanced Studies, Bremen, Mar 2001); Annual Editorial Board Meeting of *Policy and Politics* (Bristol, Mar 2001); International Association of Technical University Librarians (Delft, Netherlands, May 2001); Knowledge & Discourse 2 (U. Hong Kong, Jun 2002); International Sociological Association (Brisbane, Jul 2002); Karl Popper Centenary Congress (U. Vienna, Jul 2002); Swedish Society for the History of Psychology (Helsingborg, Jun 2003); 'Moralization of the Markets' (Kulturwissenschaftliches Institut, Schloss Elmau, Germany, May 2004); '18<sup>th</sup> C. European Thought and the Nature-Culture Problem in Advanced Technoscientific Societies' (Helsinki, Sep 2004); UNESCO Forum Colloquium on Research and Higher Education Policy (Paris, Dec 2004); 'Political Philosophy of Science' (UNAM, Mexico City, Feb 2005); Fifth Annual Winter Workshop on Economics and Philosophy (Madrid, Apr 2005); 'The Future of University of Autonomy' (Central European University, Budapest, Apr 2005); 'European Modernism and the Information Society' (U. Illinois-UC, May 2005).

*Professional Conventions and Congresses:* Academy of Management (Denver, Aug 2002); American Association for the Advancement of Science (New Orleans, Feb 1990); American Association for Artificial Intelligence (Stanford, Mar 1992); American Educational Research Association (San Francisco, Apr 1995); American Association for the Rhetoric of Science and Technology (Chicago, Nov 1997); American Philosophical Association (Central Division, Apr 1985; Pacific Division, Mar 1987; Central Division, Apr 1990; Eastern Division, Dec 1991; Eastern Division, Dec 1996; Eastern Division, Dec 2004); American Psychological Association (Atlanta, Aug 1988; New Orleans, Aug 1989; Washington DC, Aug 1992; New York, Aug 1995); American Sociological Association (New York, Aug 1996); Australasian Association for History, Philosophy, and Social Studies of Science (U. Melbourne, Jun 2001); British Psychological Society (U. York UK, Mar 1994); British Society for the History of Science (Edinburgh, Jul 1996; Leeds, Sep 1997); British Society for the Philosophy of Science (Leeds, Sep 1995); British Sociological Association (U. Glasgow, Apr 1999 [3], U. Leicester, Mar 2002); Danish History of Science Society (U. Copenhagen, Mar 2003); History of Economics Society (Boston, Jan 1994; Stirling UK, Sep 2002); History of Science Society (Madison, Nov 1991; New Orleans, Oct 1994; Milwaukee, Nov 2002); International Association for Philosophy and Literature (U. Iowa, May 1984; CUNY Graduate Center, May 1985; U. Washington, May 1986; U. Kansas, May 1987); International Congress of Asia Scholars (Singapore, Aug 2003); International Congress of Logic, Methodology, and the Philosophy of Science (U. Salzburg, Jul 1983; Uppsala Univ, Aug 1991); International Federation of Scientific Editors (Rio de Janeiro, Aug 2000); International Society for the Study of Argumentation (U. Amsterdam, Jun 1986, Jun 1990); International Sociological Association (Brisbane, Jul 2002); Joint British-North American History of Science Societies (St Louis, Aug 2000); National Association of Science, Technology & Society (Washington DC, Jan 1993); National (formerly Speech) Communication Association (Washington DC, Nov 1983 [2]; New Orleans, Nov 1988; Alta Utah, Jul 1989; Chicago, Oct 1992; New Orleans, Nov 1994 [3]; Chicago, Nov 1997 [2]; Chicago, Nov 1999 [1]); Philosophy of Science Association (Philadelphia, Oct 1982; Pittsburgh, Oct 1986; Minneapolis, Oct 1990);

New Orleans, Oct 1994); Society for Social Studies of Science (RPI, Oct 1985; Pittsburgh, Oct 1986; Irvine, Nov 1989; Minneapolis, Oct 1990; MIT, Nov 1991 [2]; Gothenburg, Aug 1992 [2]; Purdue, Nov 1993 [2]; New Orleans, Oct 1994 [4]; U. Virginia, Oct 1995 [2]; U. Bielefeld, Oct 1996 [3]; San Diego, Oct 1999 [3]; Vienna, Sep 2000; Cambridge MA, Nov 2001 [2]; Milwaukee, Nov 2002 [2]); Society for the Advancement of Socio-Economics (U. Montreal, Jul 1997); Western Social Science Association (Denver, Apr 1988; Albuquerque, Apr 1989); World Congress of Philosophy (Boston, Aug 1998).

*Invited Papers at Academic Colloquia and Conferences:*

**North and South America:** California State U. at Fullerton (Mar 1994); Carnegie-Mellon U. (Sep 1993); Colorado College (Feb 1987); Cornell U. (Sep 1988); Duke U. (Mar 1991; Apr 2001); Harvard U. (Apr 1986 [2]); McGill U. (Sep 1999); Memphis State U. (Jul 1988, May 1990); Northwestern U. (May 1989, Jan 2004 [2], May 2005); Oberlin College (Apr 1988); Princeton U. (Apr 1993); Stanford U. (Mar 1991); SUNY at Binghamton (Jan 1988); SUNY at Stony Brook (Dec 1983, Oct 1988); Temple U. (Apr 1986); U. Alberta (Nov 1999); U. California Berkeley (May 2003); UCLA (Oct 2001 [2]; Apr 2002 [7]; Apr 2003 [2]); U. Colorado at Boulder (Apr 1983, Feb 1985, Feb 1986, Apr 1987, Apr 1988); U. Colorado at Colorado Springs (Sep 1987, Apr 1992); U. Georgia (Jan 1993 [2]); U. Guadalajara (Apr 1996 [2]); U. Hawaii (Jul 1989); U. Illinois-UC (Nov 1989 [3]); U. Iowa (Oct 1987, Mar 1989, Dec 1989 [2], Apr 1991, Jun 1993, Nov 1997, Apr 2000 [2]); U. Kansas (Nov 1986); U. Louisville (Feb 1987 [2]); U. Maryland at College Park (Mar 1997); U. Massachusetts at Amherst (May 1989, Sep 1999); U. Michigan at Ann Arbor (Jan 2001); U. Minnesota (Apr 1989, Oct 1989, Apr 1994 [2]); U. New Hampshire (Jun 1993); U. North Carolina at Chapel Hill (Jan 1995); U. Notre Dame (Oct 1992, Mar 1997); U. Pittsburgh (Feb 1989, Mar 1990, Oct 1992, Nov 1992, Feb 1993, Oct 1993, Jan 1994 [3], Mar 1994, Apr 1996, Feb 2004); U. Puget Sound (Apr 2004 [2]); U. Santa Clara (Feb 1986); U. Sao Paulo, Brazil (Sep 2000); U. South Florida (Dec 1989); U. Toronto (Nov 1990, Oct 1995 [2], Oct 2002); U. Utah (Jan 1995 [2]); U. Virginia (Dec 1988, Mar 1994, Oct 1994 [4]); U. Waterloo, Canada (Nov 1990); U. Western Ontario (Jan 1985, Nov 1990); Virginia Tech (Oct 1986, Mar 1988, Dec 1988, Jan 1989, Mar 1990, Dec 1990, Jan 1991 [2], Apr 1991 [2], Jan 1992, Oct 1992 [2], Mar 2005); Wayne State U. (Jan 2001); Wesleyan U. (Oct 1988, Apr 1993); Washington State U. (Apr 2004); York U., Toronto (Nov 1990, Sep 1999, Nov 2002).

**United Kingdom and Ireland:** Aston U. (Apr 2004); Bolton Institute (Oct 2000); Bristol U. (Mar 2001, Nov 2003, Feb 2005); Brunel U. (Mar 1987, Nov 1991, Mar 1999); Cambridge U. (Nov 1995, Dec 1995, Jan 2003); Dublin City U. (Nov 2003); Dundee U. (Feb 1998); Durham U. (Apr 1994, Sep 1994, Dec 1994, Mar 1995, Oct 1995, Nov 1995, May 1996, Jan 1997 [2], Dec 1998); U. East Anglia (Apr 2001, Aug 2002); Edinburgh U. (Nov 1991, Nov 1996); Imperial College London (Oct 1996, Feb 2000, Dec 2000, Feb 2002, Jan 2003, Feb 2004, Jan 2005); Institute of Education, London (Jan 2000); Kings College London (Feb 2000, Dec 2003); Lancaster U. (Mar 1995, Jul 2004); Leeds U. (Nov 2001 [2]); Leicester U. (May 2001, Oct 2004); Loughborough U. (Feb 2002); Manchester U. (Oct 2000 [2]); Newcastle U. (Jan 1997, Dec 1997, Nov 1998); Open U. (Oct 1997); Oxford Brookes U. (Oct 2000); Plymouth U. (Feb 1996); Reading U. (Nov 1997); Strathclyde U. (Sep 1986); Sussex U. (Sep 1987, Dec 1991, Mar 1996); Teesside U. (Sep 1996); U. Wales at Aberystwyth (Feb 2000); U. Wales at Cardiff (Nov 1994); Warwick U. (Feb 1999, Oct 1999, Nov 1999, Feb 2000 [2], May 2000, Oct 2000; Mar 2001, Nov 2001); U. West of England (Dec 1998, Feb 2002); York U. (Oct 1997, Nov 2004).

**Continental Europe:** Aalborg U., Denmark (Mar 2002); Central European U., Budapest (Feb 2004); Center for History & Philosophy of Science, Berlin (Dec 1994 [2]); Chalmers University of Technology, Sweden (Jan 1999; Mar 2001); Copenhagen Business School (Jan 2000 [2]; Mar



2002 [4]; Jan 2003, May 2004); Danish Royal Academy of Sciences (May 1995); Danish Royal School of Pharmacy (Feb 2003); Erasmus U. of Rotterdam (Mar 2000, Apr 2000); Free U. Amsterdam (Mar 1999 [2]; Jun 2000); Free U. of Brussels (Dec 1997); ISCTE, Lisbon (Mar 1999 [2]); Institute for Social Studies, The Hague (Oct 1997); Inter-University Centre, Dubrovnik, Yugoslavia (May 1990); Roskilde U., Denmark (May 1995); Konrad Lorenz Institute, Austria (Jun 1997 [3]); Kulturwissenschaftliches Institut, Essen, Germany (Sep 2001, Sep 2002 [2], May 2004 [2], Mar 2005 [2]); Royal Institute of Technology, Stockholm (Apr 1995, May 1995); Soviet Academy of Sciences, Leningrad Unit (May 1990); Stockholm Business School (Jan 1999); Swedish Collegium for Advanced Study in the Social Sciences (Feb 1995); U. Amsterdam, Netherlands (Nov 1990); U. Basque Country, Spain (Apr 1999; Jun 2000); U. Bielefeld, Germany (Jul 2003 [2]); U. Catania, Italy (Oct 2001); U. Copenhagen, Denmark (Oct 1992 [2]; May 1995; Feb 2003; Mar 2003 [2]); U. Gothenburg, Sweden (Oct 1992, Sep 1994, Apr 1995 [2], May 1999; Mar 2001 [2]); U. Groningen, Netherlands (Nov 1990 [5]); U. Helsinki, Finland (Apr 1991; Oct 1998; Nov 2002 [2]); U. Innsbruck, Austria (Mar 2004); U. Linköping, Sweden (Mar 1995); U. Lisbon (Mar 2004); U. Lund, Sweden (May 1995); U. Lund-Helsingborg (May 2001); U. Oulu, Finland (Apr 1991); U. Oporto, Portugal (Mar 2004); U. Oslo, Norway (Feb 1995, Nov 1995, May 2001 [2], May 2002 [2], Nov 2003; Sep 2004); U. Oviedo, Spain (Nov. 1995 [2]); U. Paris-X, Nanterre (Dec 2000); U. Stockholm, Sweden (Apr 1995); U. Tampere, Finland (Apr 1991 [2]; Oct 1998); U. Turku, Finland (Feb 2005); U. Twente, Netherlands (Nov 1990, May 2001); U. Umeå, Sweden (May 1995 [2]); U. Uppsala, Sweden (Mar 1995 [4], May 1995).

**Asia and Australia:** Hebrew U. of Jerusalem (Dec 1995); Hong Kong U. (Mar 1998); Hong Kong U. of Science & Technology (Mar 1998); International Conference Centre, Hiroshima (Mar 1998); Keihan-na Conference Centre, Kyoto (Mar 1998); Makuhari Conference Centre, Tokyo (Mar 1998 [2]); National University of Singapore (Aug 2003); Research Centre for Advanced Science and Technology, Tokyo (Jul 1999 [2], Dec 2001); Technion (Israeli Institute of Technology) (Dec 1995); Tel-Aviv U. (Dec 1995 [2], Mar 1996, Apr 1997); Tokyo International Christian University (Jan 2002); Tokyo Institute of Technology (Aug 1999, Dec 2002); U. Indonesia, Jakarta (Jan 2003); U. New South Wales (Jul 2002 [3]); U. Sydney (Jun 2001); U. Tokyo (Jan 2002).

**Other Presentations (Mostly Non-Academic):** Associate Parliamentary University Group (House of Lords, London, Apr 2000); Bath Royal Literary and Scientific Institution (Feb 2004, Mar 2005); British Academy (Jun 2004); Café Scientifique UK (Leeds, Nov 2002, Oct 2003; Nottingham, Feb 2004; Newcastle, Sep 2004); Danish Research Council, annual meeting (Copenhagen, Feb 2003); Einstein Forum (Potsdam, Germany, May 2001); European Commission Conference on "Policies, Institutions, and Citizens in the Knowledge Society" (Barcelona, May 2002); German Science Organizations at Expo 2000 (Hannover, Germany, Jul 2000 [2]); Ford Foundation Project "Social Sciences at Risk" (Roeros, Norway, Aug 2002; Lake Arrowhead, California, Sep 2003); Gulbenkian Foundation Workshop on Challenges to Dominant Modes of Knowledge (Stanford, Nov 2004); Gulbenkian Symposium on Science and Communication (Lisbon, Mar 1999); Hayward Art Gallery Forum (London, Sep 2000); Institute of Contemporary Arts (London, Nov 2004); John Templeton Foundation on Science and Religion in the Post-Colonial World (Yogyakarta, Indonesia, Jan 2003); Knowledge & Discourse 2, Debate with Bruno Latour on the human-nonhuman distinction (Hong Kong, Jun 2002); Knowledge Management Consortium (Washington, Jan 1999); Learning Lab Denmark (Copenhagen, Mar 2003); Living Marxism Culture Wars Conference (London, Mar 1999); Mead Gallery, Warwick University (Jan 2005); New Scientist-Greenpeace Debate on 'Can Science Be Directed?' (Royal Institution, London, May 2002); First Annual Takeda Foundation Symposium (Helsinki, Jun 2002; Uppsala, Jun 2002); UK Economic and Social Research Council (London,



Apr 1998); UK Particle Physics and Astronomy Research Council (London, Apr 1998); US National Science Foundation Conference on the Economics of Science (Washington, Jan 1995);

#### CONFERENCES AND PANELS ORGANIZED

1. Disciplinary Boundaries and the Rhetoric of Rationality (organized with Charles Willard), seminar sponsored by the Speech Communication Association, held at its national convention (Chicago, Nov 1984). Editor of a special follow-up issue of *Explorations in Knowledge* (Summer 1986) [reviewed in *Metascience* (1986)].
2. The Cognitive Turn? The Relevance of Psychology to the Sociology of Science (organized with Steve Woolgar and Marc De Mey), conference in preparation of the Sociology of the Sciences Yearbook volume. (University of Colorado, Nov 1987).
3. Can Science Be Planned? (organized with Howard Smokler), the 12th Annual Regional Conference in the History & Philosophy of Science (University of Colorado, Apr 1988).
4. Five panels on the philosophy of the social sciences (organized with Raphael Sassower), the 30th Annual Western Social Science Association meetings (Denver, Apr 1988).
5. The Mutual Relevance of Science Studies and Science Policy (organized with Will Shadish) Virginia Tech (May 1989) Technical panel on the rhetoric of science, AAAS (New Orleans, Feb 1990).
6. Symposium on the philosophy of science, American Philosophical Association, Central Division (New Orleans, Apr 1990).
7. Annual conference of the Center for the Study of Science in Society: "The Rhetoric of Science" (organized with Mordechai Feingold), Virginia Tech (Apr 1991).
8. Course Director in Sociology of Science, Inter-University Graduate Centre, Dubrovnik, Yugoslavia (May 1991).
9. Mini-conference on Social Epistemology and Social Theory of Knowledge (organized with Aant Elzinga), in connection with the 9th International Congress of Logic, Methodology, and the Philosophy of Science (Uppsala, Sweden, Aug 1991).
10. Symposium on the Historical Lessons of Methodological Struggles in the Social Sciences, History of Science Society annual meeting (Madison, Nov 1991).
11. Four sessions on social epistemology at the Joint 4S/EASST meeting (Gothenburg, Sweden, Aug 1992).
12. Workshop on Ethics in Cyberspace for Informational Professionals, Meckler Annual Computers in Libraries Workshop (co-organized with Laverna Saunders, Washington, Feb 1993).
13. Annual conference of the Center for the Study of Science in Society: "STS -- Theory and Practice" (Virginia Tech, Apr 1993).
14. Politics and Science Interest Group (organized with Aant Elzinga): 4S meeting (Purdue, Nov 1993).
15. Two workshops on the "Political Rhetoric" and the "Rhetorical History" of the US National Information Infrastructure: Directions and Implications of Advanced Computing Symposium, sponsored by Computer Professionals for Social Responsibility (MIT, Apr 1994).
16. Symposium on the legacy of Paul Feyerabend for the history, philosophy, and sociology of science (organized with Sal Restivo): Joint meeting of the HSS, PSA, and 4S (New Orleans, Oct 1994).
17. Conference on Science's Social Standing (organized with the Centre for the History of the Human Sciences); Durham University, Dec 1994.
18. Symposium on the legacy of Thomas Kuhn for science studies: Joint meeting of EASST and 4S (Bielefeld, Oct 1996).
19. First Global Cyberconference on Public Understanding of Science: ESRC-sponsored. (website: <http://www.dur.ac.uk/~ds0www1/>). Feb 25-Mar 11, 1998.
20. Plenary session, 'Biology in Social Thought and Social Policy', British Sociological Association, Apr 1999

21. Flagged session, 'Sociology's Role in the Public Understanding of Science', British Sociological Association, Apr 1999.
22. Global Cyberconference on Peer Review in the Social Sciences: ESRC-sponsored; hosted by Science Policy Support Group, London (website: <http://www.sciencescity.org.uk/cyberconference.html>). May 28-Jun 14, 1999.
23. Sub-plenary session on 'Will Eugenics Be a Problem for the 21<sup>st</sup> Century?', Joint 4S/EASST meeting (Vienna, Sep 2000).
24. Third Annual International Social Theory Consortium meeting, Inter-University Centre, Dubrovnik Croatia (Jul 2002), co-organized with Charles Turner and Ralf Rogowski
25. The Legacies of Thomas Kuhn, History of Science Society, Milwaukee, Nov 2002.
26. Fleck Prize Symposium on Randall Collins' The Sociology of Philosophies, Society for Social Studies of Science, Milwaukee, Nov 2002.
27. 'Economics, Science and Democracy', Fifth Winter Workshop in Economics and Philosophy, UNED (co-organized with Jesus Zamora Bonilla), Madrid, Apr 2005.

## EDITORIAL AND REFEREEING WORK

### *Editorships: Book Series*

The Conduct of Science, Guilford Press, New York (1992-96). 8 books published.

### *Editorships: Journals*

1. Social Epistemology: A Journal of Knowledge, Culture, and Policy, published quarterly by Taylor and Francis Ltd (London), starting January 1987, founding editor, executive editor (1987-1997).
2. Technoscience: The Newsletter of the Society for Social Studies of Science, Triquarterly, Executive Editor (1989-1997).

### *Special Edited Issues of Journals*

1. Social Epistemology, vol. 13, nos. 3/4 (July-December 1999). Forum on Japanese Social Epistemology. (This was after the end of my editorship of the journal.)

### *Editorial Board Membership*

Psychology, Electronic journal associated with Behavioral and Brain Sciences, and sponsored by the American Psychological Association, Sub-editor for social epistemology, starting May 1990.  
Philosophy of Science, the official journal of the Philosophy of Science Association, 1991-1995.  
Science Studies, starting July 1993.

Sociological Research Online, the official electronic journal of the British Sociological Association, founding editorial board member, October 1995.

Futures: The Journal of Planning, Forecasting and Policy, starting March 1996.

The Journal of Islamic Science, starting February 1997.

Information, Communication and Society, founding editorial board member, 1997.

POROI (Project on the Rhetoric of Inquiry), founding editorial board member of electronic journal, 2000.

Knowledge and Innovation: Journal of the KMCI (Knowledge Management Consortium International), founding editorial board member of electronic journal, 2000

TAMARA: Journal of Critical Postmodern Organization Science, founding editorial board member, 2001

VEST: Nordic Journal for Science and Technology Studies (Swedish and English), starting March 2002.

History of the Human Sciences, starting January 2003.

Philosophy and Rhetoric, starting March 2003

SciPolicy (US on-line journal of science and health policy), starting May 2003.

Epistemologia & Filsofiia Nauki ('Epistemology and Philosophy of Science'), starting October 2003, Russian Academy of Sciences.

***Journal Referee (other than those listed above):***

Accounting, Organizations and Society; American Behavioral Scientist; American Journal of Sociology; American Sociological Review; Annals of Scholarship; Behavior Therapy; Body and Society; British Journal for the Philosophy of Science; Canadian Journal of Sociology; Environmental Values; Compare; European Journal of Social Psychology; Explorations in Knowledge; Global Environmental Policy; Health Research Policy and Systems; Informal Logic; The Information Society; Inquiry; International Studies in Philosophy; Interciencias; Journal of the History of Ideas; Journal of Personality and Social Psychology; Journal of Social Behavior and Personality; Minerva; New Ideas in Psychology; Perspectives on Science; Philosophy of the Social Sciences; Political Studies; Public Understanding of Science; Qualitative Research; Research Policy; Review of International Studies; Science and Engineering Ethics; Science in Context; Science, Technology & Human Values; Social Studies of Science; Sociology; Sociology of Health and Illness; Sociological Review; Sociological Theory; Studies in History & Philosophy of Science; Synthese; Technology Studies; Theory, Culture & Society; Trends in Ecology and Evolution.

***Book Publisher Referee:***

Acumen, Basil Blackwell, Butterworth-Heinemann, Cambridge University Press, Central European University Press, Cornell University Press, Guilford Press, Harvard University Press, Harwood Academic Publishers, Indiana University Press, Institute of Physics Publishing Ltd, Kluwer Academic Publishing, Liverpool University Press, Macmillan, MIT Press, Oxford University Press, Paradigm Press, Pearson Education, Plenum Press, Polity Press, Princeton University Press, Routledge (London & New York), Rowman & Littlefield, Rutgers University Press, Sage Publications (London & California), St. Martin's Press, State University of New York Press, Taylor & Francis Ltd, Temple University Press, Transaction Books, University of Chicago Press, University of Minnesota Press, University of Pittsburgh Press, University Press of Florida, University Press of Virginia, University of Toronto Press, Westview Press.

***Grant Proposal Referee:***

Academy of Finland, Australian Research Council, Economic and Social Research Council (UK), Leverhulme Trust (UK), National Endowment for the Humanities (US), National Science Foundation (US), Social Science Research Council (Canada).

**MAJOR COMPETITIVE GRANTS**

2002-6 Co-Investigator, Ford Foundation Project, "Social Science at Risk," co-directors Davydd Greenwood and Morten Levin (Renewed 2004)

1991 National Endowment for the Humanities Summer Institute Co-Directorship (with Joseph Rouse), Wesleyan University (topic: Science as Cultural Practice) (\$157,960).

**MINOR GRANTS**

**External**

2004. European Union external consultant for project, 'The entrepreneurial university' (€2000)

2003. ESRC travel grant for Hidetoshi Kihara for book translation (£1300)

2002-3. Ford Foundation research grant for 'Social Sciences at Risk' (\$3500)  
 2000. British Academy Travel Grant for conference in the US (£631)  
 1999. Economic and Social Research Council grant to study peer review in the social sciences (£10,800)  
 1998. (awarded in 1997) Economic and Social Research Council research fellowship in Public Understanding of Science (£20,000)  
 1996. Grant from the British Council to deliver keynote address in Hong Kong (£800)  
 1994. Combined grants from the Times Higher Education Supplement, Taylor & Francis Publishers, Sage Publications, John Wiley & Sons, European Association for the Study of Science & Technology to hold 'Science's Social Standing' conference in Durham (£1175)  
 1989. National Endowment for the Humanities Summer Seminar Fellowship, University of Hawaii (topic: Naturalistic Epistemology; director: Larry Laudan). (\$2750).  
 1989 (awarded in 1988) National Science Foundation Post-Doctoral Research Fellowship (\$21,000)

#### **Internal**

2002. Warwick University Research Committee (Sociology Department), Travel Grant for conference in Australia (£1421).  
 2001. Warwick University Research Committee (Sociology Department), Travel Grant for conference in the US (£350)  
 2000. Warwick University Research Committee (Sociology Department), Travel Grant for conference in the US (£326)  
 1999. Warwick University Research Committee (Sociology Department), Travel Grant for conference in the US (£400)  
 1998. Durham University Staff Travel Grant (£300) for conference in India (eventually declined).  
 1994-7. Durham University Staff Travel Grant (£400-600 per year) for conferences in the United States  
 1994. Combined grants from the Vice-Chancellor, Dean of Social Science, Departments of Sociology, Philosophy, Physics, Psychology to hold 'Science's Social Standing' Conference at Durham University (£1050)  
 1991-2. Two Virginia Tech Supplemental Travel Grant (total \$2300) for conferences in Sweden.  
 1990. Two Virginia Tech Supplemental Travel Grants (total \$1800) for conferences in Yugoslavia and the Netherlands.  
 1987. Grant-in-aid for Conferences, to fund the 1989 Sociology of the Sciences Yearbook Conference (\$6700), Colorado.  
 1987. Junior Faculty Development Fellowship Award (\$5000), Colorado.

#### **MEDIA COMMENTARY**

##### *Newspaper & Magazine Articles, Reviews, and Letters*

1. Making Truth (Reply to Richard Rorty's 'The Contingency of Language'), Letter to The London Review of Books, 23 Oct 1986.
2. Review of The Scientific Attitude by Frederick Grinnell, in The Scientist, 27 Jun 1988.
3. Review of Artificial Experts by Harry Collins, in Times Literary Supplement (TLS), 23 Aug 1991.
4. Review of Dreams of a Final Theory by Steven Weinberg, in The Kansas City Star, 7 Mar 1993.
5. Studying Knowledge Production (Reply to Peter Dear's review of Philosophy, Rhetoric, and the End of Knowledge), Letter to Times Higher Education Supplement (THES), 17 Sep 1993.
6. Beware the Pet Project, THES, 12 Nov 1993.



7. Popper's Scientific Legacy, Letter to The Independent, 21 Sep 1994.
8. British Innovation for Export, Letter to The Independent, 10 Nov 1994.
9. In Snow's Shoes, THES, 11 Nov 1994.
10. Scientists and Sociologists Explore Links, THES, 9 Dec 1994 (on the Durham 'Science's Social Standing' conference).
11. Who Speaks for Science?, Letter to The Sciences, March/April 1995.
12. Death to All Magic Bullets, New Scientist, 6 May 1995, pp. 53-54.
13. Post-Gutenberg Galaxy Wars, THES, 12 May 1995 (on the implications of the internet for academic research; follow-up on 9 Jun 1995)
14. Fight to the Finish, THES, 26 May 1995 (on whether science puts an end to history, or history to science)
15. Popper's Sense of Science, Letter to the Editor, TLS, 30 Jun 1995.
16. Naturvidenskab og Humaniora ('Natural Sciences or Humanities?' in Danish), Kultur Weekendavisen (Copenhagen), 14-20 Jul 1995, p. 10.
17. Trade-off in promotion of UK science, Letter to the Editor, Financial Times, 14 Sep 1995.
18. Too many scientists for a shrinking market, Letter to the Editor, Financial Times, 21 Nov 1995.
19. Cold comfort for science, Letter to the Editor, THES, 5 Janu 1996.
20. On disinventing nuclear weapons, Letter to the Editor, The Guardian, 7 Mar 1996.
21. Different stories, Letter to the Editor, New Statesman, 29 Mar 1996 (on the need for master narratives in science)
22. Never in physics, Letter to the Editor, The New York Times, 23 May 1996 (on the Sokal hoax in Social Text).
23. A New Deal for National Science Policy, Nature, 23 May 1996, pp. 273-274.
24. Post vs. Postmodern, Guest editorial, Postmortem, 4 Jun 1996 (Response to Washington Post editorial on the Sokal hoax, published in the electronic deconstructor of the Post's news and editorial policies): <http://www.geocities.com/CapitolHill/1848/fuller.htm>.
25. Letter in response to the 'Sokal Hoax', Lingua Franca, Jul-Aug 1996.
26. Smoke screen, Letter to the Editor, Independent on Sunday, 4 Aug 1996.
27. The Sokal Hoax, Letter to the Editor, TLS, 20 Dec 1996.
28. Out of Context, Letter to the Editor, Nature, 9 Jan 1997.
29. Unwanted science dictates, Letter to the Editor, THES, 7 Mar 1997.
30. Black American sounds better than English, Letter to the Editor, Independent on Sunday, 1 Jun 1997 (on ethnomathematics).
31. Let us keep a sense of proportion, Letter to the Editor, THES (on the future of science education), 24 Oct 1997.
32. Scientific content and social context in the history of science, Letter to the Editor, Chronicle of Higher Education, 3 Apr 1998.
33. The Human Touch, feature magazine article, Independent on Sunday (on the controversies surrounding science studies), 28 Jun 1998.
34. A code of practice for media coverage of science. THES, 13 Aug 1999.
35. Reply to Leadbetter: social scientists should be critical not useful to New Labour, Letter to the Editor, THES, 22 Oct 1999.
36. Socialism in the US (response to Richard Sennett), Letter to the Editor, TLS, 9 Jun 2000.
37. Paradigm Lost (on Kuhn's Obsolescence), New Scientist, 15 Jul 2000, pp. 46-47.
38. Wham, bam, no thanks Uncle Sam (on the establishment of endowments in UK universities), Letter to the Editor, THES, 22 Sep 2000.
39. How it all adds up (on school maths study), Letter to the Editor, Guardian, 4 Oct 2000.
40. Kuhnian Raimdance, Letter to the Editor, London Review of Books, 23 Aug 2001.
41. Too busy obeying to challenge (on public intellectuals in the UK academy), Letter to the Editor, THES, 12 Oct 2001.

42. Letter to the editor, *Science and Public Affairs*, Apr 2002.
43. Communication should not be left to scientists, *Nature*, 4 Apr 2002.
44. The trouble with facts (on Tony Blair's Speech to the Royal Society), *New Scientist*, 22 Jun 2002.
45. Examine the logic (on external examining), Letter to the Editor, *THES*, 9 Aug 2002.
46. No paradigm shift (on Stephan Wolfram's appeal to Kuhn), Letter to the Editor, *THES*, 25 Oct 2002.
47. Varsities as Fast-food Chains, *The Nation* (Bangkok), 11 Feb 2003. Also published as 'Kentucky Fried University' in *The Gulf Today* (Dubai), 6 Feb 2003; *The Straits Times* (Singapore), 13 Feb 2003; *Nepali Times* (Khatmandu). Published in Czech as 'McDonaldizace univerzity?' ('McDonaldized University?'), *Ekonom* (Prague, in Czech). In German as 'Kommt die Kentucky Fried University?' (Austria, *Der Standard*, 9 Jul 2003); online version (Jan 2003): [http://www.project-syndicate.org/series/series\\_text.php?id=1109](http://www.project-syndicate.org/series/series_text.php?id=1109) (in English, French, Spanish, German, Russian, Czech)
48. 'What Shapes Science?' Review of H.S. Jensen, et al., eds., *The Evolution of Scientific Knowledge*, *New Scientist*, 30 Aug 2003.
49. Kuhn vs Popper, Letter to the Editor (response to book review), *TLS*, 21 Nov 2003.
50. Letter to the Editor, *New Statesman*, 8 Dec 2003 (on a critique of climate change sceptics).
51. 'Who Needs the Social Sciences', *The Nation* (Bangkok), 19 Feb 2004; *Daily Times* (Pakistan), 24 Feb 2004; *The Straits Times* (Singapore), 5 Mar 2004; *Ekonom* (Prague, in Czech); *Danas* (Belgrade, in Serbian); *Kazakhstan Monitor*; on-line version (Feb 2004): [http://www.project-syndicate.org/commentaries/commentary\\_text.php?id=1468&lang=1](http://www.project-syndicate.org/commentaries/commentary_text.php?id=1468&lang=1) (in English, French, Spanish, German, Russian, Czech).
52. 'Peerless Process', Letter to the Editor, *THES*, 2 July 2004.
69. 'Critical angels' (on Richard Hoggart's call for teaching scientists about social and moral contexts), *THES*, 5 Nov 2004.
54. 'You call yourself an intellectual?' *THES*, 18 Feb 2005.
55. 'The Vanishing Intellectual'. Published in *The Nation* (Bangkok, 23 Feb 2005), *Independent* (Dacca, 23 Feb 2005), *Taipei Times* (26 Feb 2005), *El Nuevo Diario* (in Spanish: Managua, 27 Feb 2005), *Jerusalem Post* (27 Feb 2005), *L'Orient du Jour* (in French: Beirut, 28 Feb 2005), *Le Figaro* (in French: Paris, 8 Mar 2005), *Rzeczpospolita* (in Polish: Warsaw, 12 Mar 2005), *Daily Times* (Pakistan), 16 March 2005; *The Day* (Kiev, 22 Mar 2005); on-line version (Feb 2005): [http://www.project-syndicate.org/commentaries/commentary\\_text.php?id=1851&lang=1&m=contributor](http://www.project-syndicate.org/commentaries/commentary_text.php?id=1851&lang=1&m=contributor) (in English, French, German, Russian, Spanish, Arabic, Chinese, Czech).
56. 'Take Note', Letter to the Editor, *THES*, 1 April 2005.

#### *Newspaper & Magazine Interviews, Quotations*

1. *Aamulehti* (Tampere, Finland; on sociology and philosophy of science), 12 April 1991 (written by Jyrki Unistalo).
2. *Zhexue Dongtai* ("Philosophy Trends"), People's Republic of China, Nos. 4 (pp.7-10) and 5 (pp.7-9), 1992, on Social Epistemology (interviewer and translator: Ouyang Kang).
3. *Chronicle of Higher Education* (20 Jan 1993), on the need for universities to disclose financial interests in research for which they seek government funding.
4. *Chronicle of Higher Education* (6 Jul 1994), on the conflict of interest guidelines developed by the National Institutes of Health.
5. *Pittsburgh Tribune-Review* (28 Aug 1994), on Americans moving overseas.
6. *Lingua Franca*, on Bruno Latour, September-October 1994.
7. *THES*, on science's social standing, 30 Sept 1994
8. *Computing* (UK weekly) on the impending professionalization of information technology workers, 6 Oct 1994.

9. THES, electronic mail exchange on science's social standing, 14 Oct 1994.
10. THES, on the recent rise of disciplinary boundary disputes, 2 Dec 1994.
11. New Statesman, on the recent friction between scientists and sociologists, especially during the Durham 'science's social standing' conference, 13 Jan 1995.
12. The East Carolinian, on the 'two cultures' problem as it affects doctoral students in medicine, 19 Jan 1995.
13. The Daily Reflector (Greenville NC), on keynote address to Medical School Doctoral Student Association Conference, 25 Jan 1995.
14. Idehistoriska Föreningen vid Stockholms Universitet, 'Thomas Kuhn och det kalla krigets vetenskapssyn' (Swedish, by Lars Oldenberg, on public talk on Kuhn and the Cold War), 3 April 1995 (also Kungunu, no. 2, October 1995, 'Paradigmer och atombomben').
15. Chronicle of Higher Education, on the likely job loss from US technology transfer initiatives, 17 Mar 1995.
16. La Voz de Asturias (Oviedo, Spain; 'La Cultura' section), interview on 'Entre ciencia y sociedad', 16 Nov 1995.
17. Envision (UK National Council for Educational Technology), 'Read all about it' (on customized on-line newspapers), Issue One 1997.
18. THES, 'Transatlantic thought war: casualties heavy' (on the Sokal Hoax in France), 7 March 1997.
19. Daily Telegraph, 'Science and sociology fight for grip on reality', 11 April 1997.
20. Nature, 'Briefing: Science Wars', 22 May 1997.
21. 21st C. (Columbia University research magazine), 'Beyond the Social Text Hoax', Spring 1997.
22. THES, 'The fringe dwellers' (on scientific mavericks), 8 August 1997.
23. The Irish Times, 'Social scientist calls for public to have input on policy in science issues', 30 April 1999.
24. Physics Today, 'The public enters the nuclear debate', July 1999.
25. New York Times, 'Theory, Reality and Skeptical Tourists in Physics Land' (by James Glanz, including an interview on Fuller's new book on Kuhn), 1 February 2000.
26. The Chronicle of Higher Education, 'Abandon All Paradigms' (by Jeff Sharlet), Feature article on Fuller's work, especially Thomas Kuhn and The Governance of Science, 15 September 2000. Also Letters to the Editor, 13 October 2000.
27. Contra Costa Times (California), on a local referendum to close down a laser lab at Lawrence Livermore Laboratories because it was not peer-reviewed (by Andrea Widener), 17 September 2000.
28. Frankfurter Allgemeine Zeitung, 'Das Unbemerkte Neue' (on the Vienna EASST meeting session on 'Eugenics and the Neo-bioliberalism'), 11 October 2000.
29. Boston Globe, 'How ideas change' (by David Warsh, on Kuhn book), 3 December 2000.
30. Berliner Morgenpost (Germany), 'Die Freiheit der Forschung neu definieren' ('New definition of freedom of research'), 3 December 2000.
31. Die Welt (Germany), 'Wer ist der bessere Forscher' (on research impact), 20 December 2000.
32. Il Sole 24 Ore, 'Politica e Ricerca' (Italian, by Riccardo Viale, on social epistemology), 11 February 2001.
33. Frankfurter Allgemeine Zeitung, 'Kuhn und die Bombe: Paradigms Lost' (by Julia Voss, on Potsdam lecture), 17 May 2001.
34. New York Times, 'Coming to Blows over How Valid Science Really Is' (by Edward Rothstein, on Kuhn), 21 July 2001.
35. Warwick Boar, 'Unethical McWarwick' (by Joshua Layton), 19 February 2002.
36. Retorik Magasinet, 'Viden ud af Skabet' (Danish, interview with Christine Isager), March 2002.

37. The New Scientist, 'Can Science Be Directed?' (Debate with Martin Rees, Vandana Shiva, William Stewart, moderated by Crispin Tickell), 8 June 2002.  
<http://www.newscientist.com/hottopics/sciencedebates/article.jsp?debate=4>
38. South China Morning Post (Hong Kong) 'Science friction a matter of fact' (on debate with Bruno Latour), 6 July 2002. <http://education.scmp.com/ZZZPRB4Z23D.html>
39. The New Scientist, 'Who's Reading What', 24 August 2002.
40. Science, 'Next Wave: Who is Directing Science?' (by Sarah Tilley) 8 November 2002.
41. Interview with Steve Fuller on Knowledge Management and Knowledge Sharing. Rinsho Hyoka ('Clinical Evaluation' in Japanese) 29 (2002): 225-256. (English version: [http://www.sphere.ad.jp/cont/29\\_23/p225-56/menu.html](http://www.sphere.ad.jp/cont/29_23/p225-56/menu.html))
42. Interview with Steve Fuller on the state of evidence-based medicine and consensus conferences in the UK, EBM (Evidence-Based Medicine) Journal vol. 4, no. 4 (2003), pp. 86-89 (in Japanese).
43. Interview with Steve Fuller on the future of university research. Forsker Forum ('Researchers' Forum' in Danish) 166 (July/August 2003), pp. 23-25.
44. Il Sole 24 Ore, 'Cosa sapeva davvero l'Fbi' (Italian, by Armando Massarenti, on the launch of Episteme), 27 June 2004.
45. Guardian, 'Here's a few you missed...' (on the alleged lack of women intellectuals in UK), 2 July 2004.
46. THES, 'Come all ye control freaks, egomaniacs and anoraks' (on Prospect's list of top 100 UK intellectuals), 23 July 2004.
47. EMBO Reports (European Molecular Biology Organization) 'Fashion of the times' (on the impact of knowledge society on scientific research agenda), by Karen Weigmann, Nov 2004.
48. The Times (London) 'How to be an intellectual' (cover story of T2 and editorial leader), 17 Feb 2005.
49. Heureka (Vienna, research policy magazine), 'Wissens als Ware' ('Knowledge as Commodity'), no. 2, Mar 2005.
50. Guardian, 'Out of sight, out of mind' (on intellectuals), 10 May 2005.

***Radio and Television Appearances:***

1. Univ. of Iowa Public Radio (both with John Lyne): May 1989 (on social epistemology), September 1989 (on rhetoric and argument in science)
2. Univ. of Illinois Public Radio: November 1989 (on science studies and science policy).
3. Televised Public Lecture: Univ. of South Florida (Tampa), December 1989 (on science studies and science policy).
4. Univ. of Tampere (Finland) Public Radio: April 1991 (on science studies and science policy).
5. 'Science Now', BBC 4 Radio Show (with Lewis Wolpert): 3 December 1994 (on science's social standing)
6. 'Newstalk', BBC 5 Radio Show (with Steven Rose and Minister for Science & Technology, Ian Taylor): 20 March 1995 (on Science Week).
7. 'Cultural Imperialism', BBC Radio Cleveland Show: 4 July 1995 (on the Americanization of Britain).
8. 'Knowledge and Discourse Conference', Hong Kong Today Radio Show: 19 June 1996 (with Dorothy Smith and Gu Yuego)
9. 'Are We Finished With Science?', Open Saturday, BBC-TV 2: 13 June 1997 (interviewer: Howard Stableford).
10. 'The Naming of Parts', Analysis, BBC-Radio 4: 5 July 1999 (interviewer: Andrew Dilnot)
11. 'The Science Wars', Daybreak, CBC-Radio Montreal: 21 September 1999
12. 'The Trial of the 21<sup>st</sup> Century', TV-Channel 4 (UK): 2 January 2000. (expert witness on the future of community)
13. 'Thomas Kuhn', on 'Worth Knowing', Norwegian National Radio, 3 May 2001.



14. 'Science Wars' on 'Nightwaves', BBC Radio 3, 19 February 2002 (with David Papineau).
15. 'Knowledge & Discourse 2' on Radio 3, Hong Kong, 28 June 2002.
16. 'Can Physics explain society?' Today Programme, BBC Radio 4, 10 October 2003 (with Philip Ball).
17. 'Scientists clone human embryos', Morning Programme, BBC Coventry/Warwickshire, 12 February 2004.
18. 'Academic Freedom'. Odyssey show, National Public Radio, Chicago, 11 August 2004.
19. 'Democracy and Science'. Odyssey show, National Public Radio, Chicago, 16 September 2004.
20. Interview about 'Kuhn vs Popper', KVON Radio (ABC affiliate), San Francisco/Napa Valley, 7 January 2005.
21. Interview about 'The Intellectual', Thinking Allowed, BBC Radio 4, 2 March 2005.

#### **CURRICULAR MATERIALS**

1. Teaching Science & Technology Studies: A Guide for Curricular Planners, edited by Steve Fuller and Sujatha Raman. A product of the 1991 Summer Institute on Science as Cultural Practice, sponsored by the US National Endowment for the Humanities. Produced and distributed by the Center for the Study of Science in Society, Virginia Tech (1991), 62 pp. Also retrievable via [gopher://kasey.umkc.edu](http://gopher://kasey.umkc.edu)
2. Are Science and Religion Compatible? Text and readings. For Open University M.Sc. Course in Science Communication (S802). In use, starting 1998.
3. Science Wars. Interview and readings. For Open University M.Sc. Course in Science Communication (S802). In use, starting 1998.
4. Understanding Science. Interview and readings. For Open University M.A. Course, Social Science in Question (D820). In use, starting 1998.

#### **GRADUATE STUDENTS:**

##### **University of Colorado:**

Chair, Ph.D. Dissertation: Sandra Gudmundsen (1989).

Member, Ph.D. Dissertation: Mark Yount (1985), Brent Singer (1986), Valerie Broin (1987), Tavai Ananthothai (1988), Larry Goldberg (1988), Paul Saalbach (1994).

Chair, M.A. Thesis: Franz-Peter Griesmaier (1988).

##### **Virginia Tech:**

Chair, Ph.D. Dissertation: Stephen Downes (1990).

Member, Ph.D. Dissertation: Scott Hauger (1996), Garrit Curfs, Juan Rogers (1996), Juan Lucena (1996), Douglas Taylor, Amy Crumpton, James Collier.

Member, Ph.D. Prelim Exam Committee: Adam Serchuk (1990), William Lynch (1990), Rafael Balderrama (1992).

Chair, M.S. Thesis: Thomas Childress (1991), Lara Blechschmidt (1992), Ranjan Chaudhuri (1992), Peter Schwartzman (1993).

Member, M.S. Thesis: Garrit Curfs (1990), Peter Johnston (1991), Tracy Glenn (1991), James Collier (1993), Chris Furlow (1993), Stephen Galin (1992), Ming-Hui Hu (1995), Dan Dunlap (1995), David Ferro (1995).

##### **University of Pittsburgh (All in Rhetoric & Communication, unless otherwise indicated):**

Co-chair, Ph.D. Committee: Joan Leach (1996), Anand Rao (1996)

Member, Ph.D. Committee: Kirk Junker (1996)

M.A. External Examiner: Athena Beldecos (History & Philosophy of Science)  
Ph.D. External Examiner: Amir Hartman (Business)

**University of Durham:**

Chair, M.Phil. Committee: Sotiria Theoharis (1997).  
Chair, M.A. Committee: Simon Brown (1996), Nicholas Smith (1997), Tim Rogers (1997),  
 Andrew Stansfield (1999), Lyn Brierley-Jones (2000).  
Internal Examiner, M.A.: Rashida Hankin (1996)  
External Advisor, Ph.D.: Lyn Brierley-Jones

**University of Warwick:**

Chair, Ph.D. Committee: James Mitra [ESRC supported] (1999-2004), Justine Donaldson (2000-2), William Gisby (2001-4), Gerard Choo (2001- ), Hugo Mendes (2001- ), San Son (2001- ), Nigel Christian [ESRC supported] (2002- ), Jason Ming-Ying Lee (2002- ), Myoung Yong Kim (2002- ); Takeshi Okahashi (2002- ), Maiko Watanabe (2002- ); Melanie Ceppi (2003- ); Marie Thornby [ESRC supported] (2003-4); Mark B. Smith [ESRC supported] (2003- ); Stephen Norrie [ESRC supported] (2004- ); Milena Statena (2004- ); Yiannis Gioukas (2004- )  
External chair, Ph.D. Committee: Howard Sutton [Business School] (2001- )  
Chair, M.A. Committee: Evangelos Generalis (2000-2), Jerry Stephens (2000-1), Angelica Thunala (2000-1), Srila Roy (2001-2), Edward Tolhurst (2002-3).  
Internal Examiner, Ph.D.: Lee Marshall (2001).  
External Pre-Doctoral Advisor: Tarcisio Zandonade (University of Brasilia, 2001-2), Vidar Ennebakk (University of Oslo, 2002-3)  
External Post-Doctoral Advisor: Wu Wei (Xiangtan National University, China, 2002-3).

**COURSES TAUGHT:**

**University of Colorado:**

Undergraduate -- Introduction to Philosophy of Science, Social and Political Philosophy,  
 Philosophy of Law (all courses aimed primarily at liberal arts majors)

Graduate -- Social Epistemology, Philosophy of History, Continental Philosophy

**Virginia Tech:**

Undergraduate -- Science and Values (service course required of science and engineering majors)

Graduate -- Sociology of Science, Historiography of Science, Sociology of Intellectuals, Science Policy in Interdisciplinary and Transnational Perspective

**University of Pittsburgh:**

Undergraduate -- History of Rhetoric (course required of communication majors)

Graduate -- Rhetoric of Science

**University of Gothenburg:**

Graduate -- Theory of Science

**University of Durham:**

Undergraduate -- Theories of Society (historically oriented course required of first year majors),  
 Science and Society (final honours course)

Graduate (Department) -- Sociology of Knowledge for the 21st Century, Philosophy of the Social Sciences

Graduate (Faculty) -- Postgraduate Training Programme in History of the Human Sciences,  
 Natural Sciences, Social Sciences (Newcastle University)

**University of Tel-Aviv:**

Graduate -- Philosophy and Sociology of Science

**University of Warwick:**

Undergraduate - Sociological Imagination and Investigation (required first year theory and methods course), Sociology of Science (final honours course), Social Theory of Law (required second year course for Law-Sociology majors).

Graduate - MA Philosophy and Social Theory (convenor), Philosophy of Social Sciences (required of Ph.D. students), Advanced Social Theory (Ph.D. seminar), Professional Development Seminar, Sociology of Modernity.

Tokyo International Christian University:

Undergraduate - Re-Imagining Sociology; Introduction to Science & Technology Studies

Copenhagen Business School:

Graduate - Rhetoric of Science

UCLA:

Undergraduate - Science, Communication, and Credibility

Graduate - Social Epistemology of Information Provision

University of Lund at Helsingborg:

Graduate - Re-imagining Social Science for the 21<sup>st</sup> Century; The Public Intellectual: Who? How? Why?

## **INSTITUTIONAL SERVICE**

University of Colorado

Departmental offices: Graduate Job Placement Officer (1985-7), Graduate Teaching Mentor (1986-7), Undergraduate Honors Thesis chair (1987-8), Personnel Committee member (1985-8), Graduate Studies Committee member (1985-8), Ph.D. examiner for Metaphysics & Epistemology and History of Philosophy (1987-8), Philosophy Liaison for the Comparative Literature Program (1986-7), Member of the History & Philosophy of Science and Science Policy Colloquium Committees (1985-8).

University offices: Member of Graduate School Council on the Arts and Humanities (1986-8), Member General Education Curriculum Reform Committee, Natural Sciences division (1987-8).

Virginia Tech

Departmental offices: Graduate Placement Officer (1989- ), Member of Sociology Preliminary Exam Reading List Committee (1990).

University offices: Member of Humanities, Science & Technology Undergraduate Program Committee (1988-93); Member of University Faculty Senate (1992-93); Commission on Faculty Affairs (1993).

University of Pittsburgh

Departmental offices: Committee on the Rhetoric of Science Graduate Program (1993-4)

University offices: Member of the Mellon Fellowship and Provost's Humanities Pre-doctoral Fellowship Committees (1994).

University of Durham

Department offices: Chair of Faculty Postgraduate Training Seminar Series (1995-6); Chair of the Philip Abrams Prize Committee for Best Undergraduate Dissertation (1995-9); Information Technology Committee Representative (1997-9); Member of Research Strategy Group (1997-9); Chair of Promotions Committee (1998-9).

University offices: Chair of the Board of Examiners for Sociology & Social Policy (1996-9). Founding Board Member, Institute for the Study of Change (1997-9)

University of Warwick

Department offices: Director of Research (1999-2002).

University offices: Member of the Council of the Faculty of Social Studies (1999-2002 ); Social Science Representative on the Council of the Faculty of Science (2000-2002); Chair of Review Committee on Warwick Open Studies Programme (2001).

**External Assessor**

**Tenure and Promotion:** Chalmers University of Technology, Sweden (Technology Management and Economics [2]); City College of New York (Philosophy); Clarion State University, Pennsylvania (Speech Communication); Gothenburg University, Sweden (Theory of Science); Hong Kong University of Science and Technology (Social Science); Illinois Institute of Technology (Social Sciences [2]); Indiana University (Speech Communication); Linköping University (Faculty of Arts and Sciences); London School of Economics (Sociology); Louisiana State University (Sociology); Memphis State University (Psychology); Michigan Technological University (Humanities [2]); University of Nebraska at Omaha (Economics); North Carolina State University (Multidisciplinary Studies); Oregon State University (Speech Communication); Queens University, Kingston, Ontario (Philosophy); Rensselaer Polytechnic Institute (Science & Technology Studies [3]); Saint Mary's College, Halifax, Nova Scotia (Sociology); Seton Hall University, New Jersey (Sociology); State University of New York at Binghamton (Philosophy); SUNY at New Paltz (Sociology); University of Birmingham (Sociology); University of California at Berkeley (Rhetoric); University of Helsinki (Sociology); University of Liverpool (Sociology [2]); University of New Hampshire (Philosophy [2]); University of Pittsburgh (Communication [2]); University of Plymouth, UK (School of Human Sciences); University of Sussex (Science Policy Research Unit [2]); University of Texas (Public Policy); University of Toronto (History & Philosophy of Science); UCLA (Information Studies); University of Virginia (Sociology [2]).

**Doctoral Dissertations:** Copenhagen Business School (Management, Politics, and Philosophy); Imperial College London (Science Communication); State University of New York at Stony Brook (English); Gothenburg University (Theory of Science [2]); Nottingham Trent University (English & Media Studies); University of Toronto (History & Philosophy of Science)

**Postgraduate Courses:** Imperial College, London (M.Sc. in Science Communication, 1996-2000); University of Leeds (M.A. in Philosophy)

**Undergraduate Courses:** Lingnan University, Hong Kong (B.A. in Politics and Sociology, 2003-6); University of Liverpool (B.A. in Sociology, Social Policy, 1999-2003); University of Leeds (B.A. in Philosophy and History & Philosophy of Science, 2001-3).

**PROFESSIONAL MEMBERSHIPS AND OFFICES**

American Philosophical Association, member 1982-

Philosophy of Science Association, member 1984-

Society for the Social Studies of Science (4S), member 1985-

Ex officio member of Council, 1990-1997

Head of Outreach Committee, 1992-1994

Member of Council, 1998-

Chair of the Rachel Carson Book Prize Committee, 1999-2000

Member of Ludwik Fleck Book Prize Committee, 2000-2001

Chair of the Visions Committee, 2000-2001

Member of the Ludwik Fleck Book Prize Committee, 2000-2001

European Association for the Study of Science & Technology (EASST), 1985-

Member of Publications Committee, 1992-1998

Member of Council, 1994-1998

American Sociological Association, member 1990-;

British Sociological Association, member 1994-;

Group for the Study of the Institutionalization and Professionalization of Knowledge

Production (GRIP), steering committee 1990-;

Teachers for a Democratic Culture, steering committee 1992-;

History of Science Society, member 1993-

American Association for the Rhetoric of Science & Technology (AARST), founding



Vice-President, 1993-1994;  
Business Processes Resources Centre, Warwick University, member of advisory board, 1999-